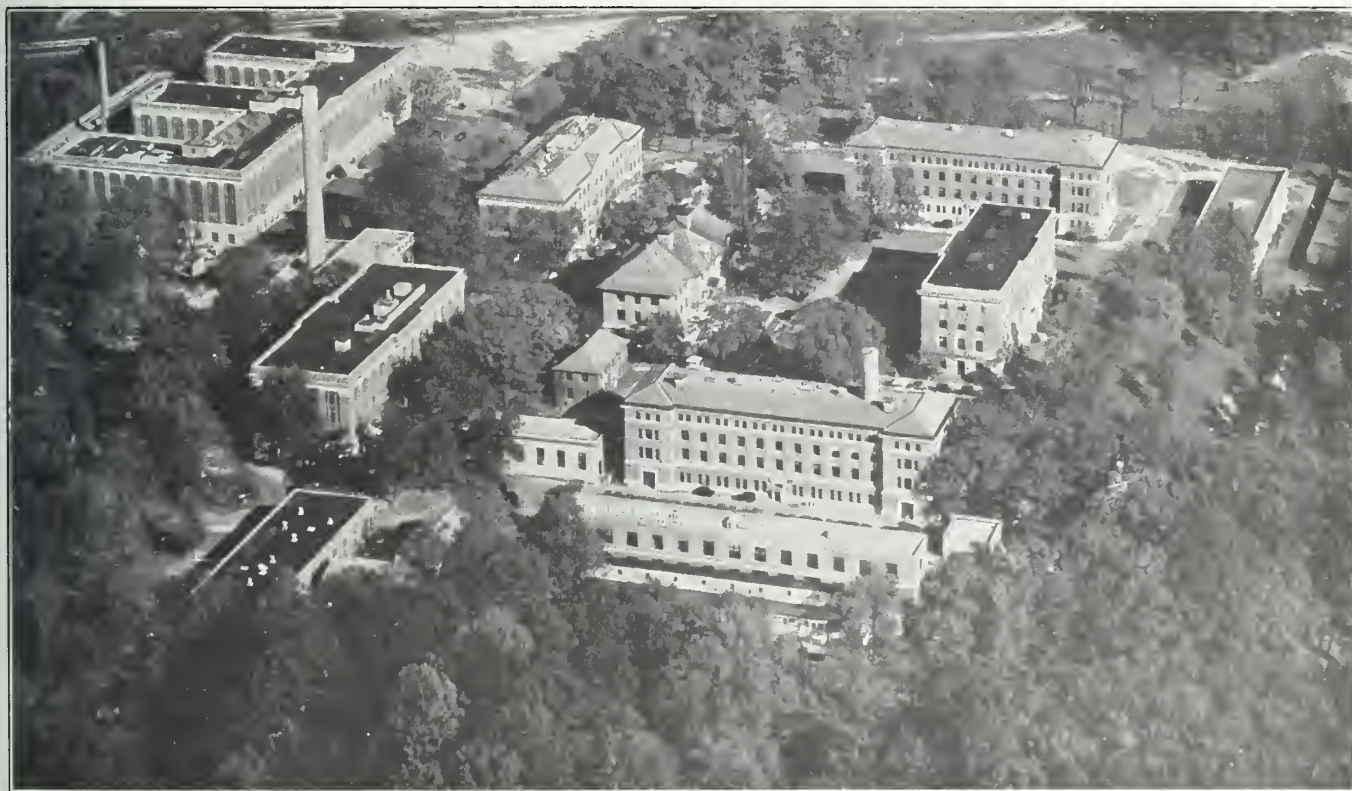


COMMERCIAL STANDARDS MONTHLY



*A Review of Progress in
Commercial Standardization and Simplification*



AIRPLANE VIEW OF BUREAU OF STANDARDS

ISSUED BY THE BUREAU OF STANDARDS OF THE UNITED
STATES DEPARTMENT OF COMMERCE, WASHINGTON, D. C., U. S. A.

Vol. 8, No. 6



DECEMBER, 1931

The Commercial Standardization Group

DIVISION OF SIMPLIFIED PRACTICE

Edwin W. Ely

The division of simplified practice cooperates with industrial and commercial groups to reduce waste, usually through eliminating unnecessary variety of product, method, or practice. Its function is to bring together all parties interested in a project of this character, and to coordinate their work in developing a simplified practice recommendation. Such work includes surveys of current practice, formulation of a simplified practice program, and presentation of that program for action by a general conference representing all interests. The division then transmits to all concerned a full report of the general conference, with a request for written acceptance of the action taken. When the volume of acceptances is sufficient to indicate initial success, the Department of Commerce indorses the program and publishes the recommendation. The division thereafter cooperates with a standing committee appointed by the industry concerned, in conducting periodic surveys to determine the degree of adherence, to maintain and extend support of the recommendation, and to secure data for reaffirmation or revision. Simplified practice may be applied to any commodity or activity in which it will reduce waste. The division stands ready to render service in developing and making effective any application of simplified practice which will reduce waste, stabilize business, or extend commerce.

BUILDING AND HOUSING DIVISION

J. S. Taylor

The division of building and housing, formed in 1921, cooperates with business, technical, and professional groups in furthering construction activities. It works to modernize building codes and to encourage improved standards for the quality of building construction, and the practical application of the latest development in design and use of building materials.

It encourages home ownership through the development of an enlarged, steadier, more intelligent, and more discriminating demand for dwellings—the largest single class of buildings which the construction industries provide.

The division also cooperates with other governmental agencies and with many private business and professional groups in efforts to distribute building activity more evenly throughout the year and to secure less fluctuation from year to year.

The work on city planning and zoning has the broad objective of making buildings more useful through proper location with respect to other structures, stabilizing of land values and property uses, well coordinated thoroughfare systems, and well laid out public works.

DIVISION OF SPECIFICATIONS

A. S. McAllister

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. It ascertains the Standardization and specifications promoting activities of the associations and societies, and brings to their attention the work being done by the commercial standardization group. It brings the Federal specifications and commercial standards to the attention of the maximum number of producers and users of commodities complying with these standards and specifications. It compiles and distributes lists of sources of supply of materials guaranteed to comply with the standards and specifications. It shows both buyers and sellers the benefits from handling nationally specified, certified, and labeled commodities. The division prepares directories of governmental and nongovernmental testing laboratories and the Directory of Specifications, and is working on an encyclopedia of specifications, the first two volumes of which have been issued, namely, "Standards and Specifications in the Wood-Using Industries" and "Standards and Specifications for Non-metallic Minerals and their Products." It also aids in preparing the Standards Yearbook.

STANDARDIZATION
..IS..
A CONTINUING PROCESS
~
ITS AIM IS NOT FIXITY
OR STAGNATION
..BUT..
TO ADD SERVICEABILITY
AS OFTEN AS THE
POTENTIAL GAIN
MAKES IT WORTH WHILE

DIVISION OF TRADE STANDARDS

I. J. Fairchild

The division of trade standards, on request, assists industrial and commercial groups in the voluntary establishment of standards covering grades, quality, dimensional interchangeability, or other acceptance criteria as a national basis for marketing manufactured commodities.

The detail criteria are selected or determined voluntarily by interested buyers or sellers, without any Government dictation or domination, and adjusted at a general conference of producers, distributors, and users so as to represent the composite views of all branches. The division functions chiefly as a neutral agency to see that all interested elements are given full opportunity to be heard and satisfied; to solicit and record acceptances; and to publish and promulgate the standard when a satisfactory majority of acceptances is obtained and provided there is no active opposition.

Industries are encouraged to apply self-certifying labels to products meeting the commercial standard requirements, as a means of protecting the consumer and the scrupulous seller from misrepresentation or unfair methods of marketing.

Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

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AN INVITATION TO VISIT THE NATIONAL BUREAU OF STANDARDS

A cordial invitation is extended to all interested in scientific progress to visit the laboratories of the National Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m. daily except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable; basic contributions to radio, aviation, and other modern arts and industries.

STANDARDIZATION

and PROGRESS

STANDARDIZATION is probably as much misunderstood as any subject on the calendar. Many consider it as the end of progress in the belief that standards, once adopted, are never changed. The fallacy of this notion was clearly shown the other day at a meeting of the American Standards Association when several speakers told of the benefits from standardization and how these standards were changed whenever it seemed best to do so. As expressed by one engineering representative of a large electric company, "A standard is the best compromise available at the moment," which should dispel the idea that standards prevent advancement.

The automotive industry is perhaps the best example of a highly standardized industry. And yet, as has been frequently pointed out, it is one of the most progressive industries; few make more changes in product. Whenever an adopted standard does not meet the needs of the industry, it is changed. And the standards used have reduced the cost of parts to an amazing degree.

When users fully appreciate the advantages of standardization they will demand standardized products.

—*American Machinist*, October 1, 1931.

INDUSTRIAL STANDARDS

Maintenance of Standards in Industry Just as Important for Successful Management as Their Establishment

By V. S. KARABASZ, *University of Pennsylvania*

One of the features in the development of industry in the United States in recent years has been the steady growth and improvement in industrial management. With this increasing emphasis upon management in industry came a recognition of the basic importance of industrial standards. Without the establishment of standards, control of all of the many activities of the enterprise which is so essential under modern manufacturing conditions is impossible. It is by means of standards that management develops the yardstick which it uses to measure the effectiveness of its operation regardless of whether it be the determination of the suitability of raw materials, the efficiency of labor and machines, or the cost of the article produced. Efficient management without standards is impossible.

If standards, therefore, are the basis of modern management, it must be clear that the maintenance of the standard once established is no less important than its original determination. This fact is one which is apparently not fully recognized or understood by many industrial executives. Standards do not maintain themselves. Much of the difficulty which managers have with many of the mechanisms of modern management, such as wage-payment plans, production-control systems, etc., can be directly traced to the failure to maintain properly the standards originally established.

It is with some of the fundamental ideas connected with the proper maintenance of industrial standards that this article deals. In discussing this subject the basic importance of the following ideas will be touched upon briefly: (1) The importance of reasonable standards, (2) the necessity of the "preventive" approach to the solution of the problem of maintenance, (3) the need for regularly scheduled and carefully defined inspection, (4) the importance of proper lubrication in any plan of maintenance of mechanical equipment, and (5) the value of the standing order in the maintenance of standards.

Reasonable standards.—One of the most important concepts which has to do with the proper maintenance of standards is that the established standards shall be reasonable standards capable of being met continually under normal operating conditions. The standards established should not be idle hopes but standards which should be met consistently. If standards are reasonable and can be met every time, any variation from standard can be carefully investigated and the standard will in reality act as a ratchet, preventing anything inferior from being accepted. If, on the other hand, the standards which have been established are too severe and are seldom met, variations from them are usual and are not the cause for concern on the part of the operating officials. Consequently, actual performance will drift lower and lower rather than be held up to a reasonable established standard.

The standards of most concerns in the United States, however, are too lenient and consequently too easily met, and the problem is rather the establishment of more carefully developed standards so that the best will be obtained or the most accomplished under the given set of conditions.

Preventive maintenance.—The basic idea underlying modern maintenance methods is prevention. No longer does the maintenance department merely act as a repair department awaiting calls to repair machines which refuse to operate. The modern maintenance department has for its function the prevention of breakdowns and the maintenance of machinery, equipment, etc., in standard condition. It is no longer satisfied, merely when the machine is operating, but the machine must operate up to what has been established as standard performance for it.

Inspection.—This function of prevention, which underlies all modern maintenance, is carried out in industry to-day by means of periodic inspections of plant, machinery, equipment, etc. Although the idea of preventive maintenance through regular inspection is rather well known in industry, few plants have developed a technique of inspection which really fulfills the purpose for which it is established.

Preventive inspection, if it is really to function, must be the fixed responsibility of some one person or group of persons within the organization who in large organizations devote their entire time to this work. Many organizations have attempted to make inspection a job which is to be performed only when there is no other work to be done. For example, it is not unusual to find electricians who are expected to inspect the electrical equipment when they are not engaged in regular repair or replacement work. Needless to say, this arrangement seldom is satisfactory because electricians and other mechanics under these conditions are scarcely ever free for inspection work. With them inspection, because of the urgency of other work, is of secondary importance. Moreover, if inspection is to prove really valuable and if it is not to degenerate into a casual examination, its technique must be carefully developed and strictly adhered to. In developing this technique the following are some of the basic requirements which must be met: (1) Establishment of definite standards, (2) the development of a definite schedule of inspection, (3) the development of a tickler file, (4) the development of the method of inspection, and (5) follow up of failures of machinery and equipment.

It is obvious that if standards are to be maintained there must first be standards. Many companies do not have clearly defined standards of machinery and equipment and consequently in such cases it is difficult, if not impossible, to determine when the article being inspected requires attention. It is therefore necessary for companies to carefully study their plant.

machinery, equipment, etc., to determine definitely what shall be accepted as standard, which, of course, should not be any less than the best under the given set of conditions. Some companies with well-developed maintenance programs, in taking over new factories where little attention has been paid to maintenance, make it a practice to completely overhaul machinery and equipment to be certain that it has been placed in the standard condition which had been determined by them as a result of careful study.

After standards have been established it is necessary to develop a schedule of inspections. A careful study should be made to determine the frequency of inspection of the various parts to be inspected. Obviously, all parts do not wear alike. Some may require only an annual inspection, while others may require a weekly or even more frequent inspection.

After the schedule of inspection has been developed a tickler file should be established. This tickler will be the means of bringing attention automatically to the time when specific inspections should be made.

The method of inspection should be carefully developed and well defined. The inspector should be told what to inspect and how to inspect and he should be called upon to make a written report on the result of every inspection. If the inspector is called upon to report on every item of his inspection, a thorough and complete inspection is assured. Many companies have found that unless inspection methods are clearly defined and reports are obtained from the inspector the effectiveness of their work is greatly reduced.

An excellent manner of checking the effectiveness of inspections, and in improving the techniques of inspection is to carefully check all failures of machinery and equipment. As a result of this study of failures the established inspection schedules may be modified and changes in the method of inspection brought about.

Lubrication.—In any discussion of preventive maintenance the importance of correct lubrication as a preventive measure in connection with mechanical equipment must be stressed. A study of mechanical breakdowns will show that a very large number can be directly attributed to inadequate and improper

lubrication. Prevention of these breakdowns implies supplying the proper quantity of lubricant and little attention has been devoted to type of lubricant to be used and to the points to be lubricated. In the past there has been much waste in lubrication. At the present time much study is being devoted to the selection of the proper lubricant, and to getting this lubricant to the parts of the machine which need it.

Wherever possible, machines are being equipped with automatic positive lubrication mechanisms by means of which sufficient lubricant is forced under pressure to every point requiring it.

Standing order for maintenance department.—An invaluable aid in maintaining standards is the use of the standing order. For the maintenance department the standing order explains in detail the purpose of the department, its functions, and its methods of operation. It is a manual of operation which instructs the members of the department in their work and insures that the standards of operation which have been established as a result of careful study of the work of the department will be maintained by those who are responsible for their execution.

Maintenance of standards.—The importance of the maintenance of the established standards within an enterprise can not be overemphasized. While it is true that much good can come to an organization merely as a result of the careful thought and study necessary to determine standards, it is also true that after standards are once established if they are not carefully enforced or maintained their very existence in the organization is soon forgotten, and the breach between what can be done and should be done and what is actually done gradually widens until the actual bears little resemblance to the standard.

The wider this breach the greater the inefficiency in the organization and the larger its losses. Unless constantly and persistently checked, standards tend to seek lower rather than higher levels. It is only by constant vigilance on the part of those who recognize the tremendous importance of standards to an organization that the established standards will be maintained.

WIND PRESSURE ON SKYSCRAPER TESTED

The Bureau of Standards has completed a model of the Empire State Building, New York's tallest skyscraper, for the purpose of studying wind loads. The model is constructed on a scale of 1 to 250, and is accordingly 5 feet high. On this scale the average human being would be a little more than a quarter of an inch high. The model has been placed in the 10-foot wind tunnel at the bureau, and pressures developed by wind up to 60 miles per hour are being measured.

It may appear strange that such measurements should be undertaken after the completion of the building, but because of unusual conditions this building offers an interesting opportunity to advance our knowledge of wind pressure. Through the cooperation of owners, architect, engineer, builder, and the research committee of the American Institute of Steel Construction, observations are in progress by the research committee on the wind velocity at the top of the Empire State Building, and the wind pressures

developed at the thirty-sixth, fifty-fifth, and seventy-fifth floor levels. These observations in themselves will be of the greatest value.

The Bureau of Standards takes advantage of this opportunity to demonstrate the value of model testing in the determination of wind pressure. The great utility of model testing has been thoroughly demonstrated, especially in the fields of aeronautics and hydraulics.

Thus the design of the new airship *Akron* was greatly facilitated by extensive model tests. Likewise, model tests have paid their cost many times in connection with water-power developments. In the field of wind pressure the utility and validity of model tests have not as yet been adequately recognized, largely because of the absence of satisfactory comparisons between models and full-scale structure. The Empire State Building offers such an opportunity, and will thus serve to give information to enable the construction of other still taller structures with economy and safety.

SIMPLIFIED PRACTICE, 1921-1931

Industry's Need for Simplification as Important in 1931 as in 1921

By RAY M. HUDSON¹

The value of simplified practice to business has been fully demonstrated by the increase in its use during the 10 years in which it has been promoted by the Department of Commerce.

In December, 1921, President Hoover, then Secretary of Commerce, established the division of simplified practice in the Bureau of Standards. The country was then just emerging from the 1920-21 depression, and many industries found themselves with excessive inventories, greatly extended lines of products, and many unnecessary sizes in those lines. Through cooperation of the division of simplified practice with manufacturers, distributors, and users of specific commodities, many industries developed and adopted simplification programs designed to reduce this needless burden on business and the buying public. The economies which resulted from putting these programs into effect unquestionably contributed toward bringing about the period of prosperity which began shortly thereafter.

After the stock-market crash in 1929 industry and business were chiefly interested in retrenchment, economy, and the liquidation of inventories. The growth of hand-to-mouth buying and rapidly changing demand during the preceding prosperous years had prevented the growth of inventories to such a point as existed at the beginning of the 1920-21 depression. Considering the actual growth in volume of all business during that period, the variety of products was not as excessive as it had been in 1921, although there was still a considerable opportunity for simplification.

When the depression set in, however, competition in selling goods in a buyers' market resulted as usual in a steady increase in variety in hundreds of commodities. Manufacturers constantly brought out new lines, types, or models to attract the buyer. This pressure toward variety invariably accompanies a buyers' market, and in the long run everybody suffers from the resulting waste.

Conditions in 1931 differ, however, from those in 1921, in one particular respect, in that the division of simplified practice has been a going concern for 10 years, during which it has succeeded in planting the idea of simplification firmly throughout industry and commerce. While in 1921 there was no centralized agency to coordinate the scattered efforts toward simplification, such an agency not only exists to-day, but its methods and results are widely recognized.

One consequence of this fact is that excessive variety of products is recognized as causing waste and expense throughout the whole chain of manufacture and distribution, and those concerned know how to avoid this waste and have the means at hand for doing so. This is demonstrated by the fact that the division of simplified practice will complete more projects for 1931 than for 1930.

During every year since the organization of the division the value of simplified practice has become more generally recognized, not only by business but by the public. The purposes and methods of the division are fully understood and have been approved by some of the largest industrial groups in the country. Simplification to-day is recognized as one of the most important factors in keeping down costs of production and distribution, and in giving the buyer full measure for his dollar. It is logical to expect that simplification will continue to be used on an increasing scale by progressive manufacturers and distributors not only because of their better understanding of its usefulness, but also because of the steadily broadening appreciation among large buyers of the economies to be gained by them.

The first 10 years of simplification have demonstrated that voluntary cooperation for self-government in business is thoroughly practicable. We may reasonably expect that the experience of the division will be used as a guide in the further application of the principle of self-government as a means of solving the problems now faced by American industry and business.

¹ Industrial executive, New England Council. Formerly Assistant Director of the Bureau of Standards.

INCREASING MARKET FOR GRADED TURKEYS

According to the New England Council there is a growing demand for New England native fancy-grade turkeys bearing the New England quality farm-products label. Directors of the State bureaus of markets report that many unregistered turkey producers are registering and applying for permission to use the label on their birds, because they say that the retail markets to whom they are trying to sell the birds are insisting that they be graded and labeled.

During the past two winters 58,000 turkeys bearing the New England label turkey tag have been sold and about 190 producers have used the labeled tags on those of their birds that were of proper quality. Last season the sale of labeled birds totaled 24,594, and the sales by States were as follows: Connecticut, 8,604; Vermont, 8,253; Massachusetts, 4,912; and Rhode Island, 2,825. The number of turkey producers using the label in Vermont increased almost 200 per cent last year, amounting from 21 at the beginning of the season to 62 at the close. In Connecticut there was an increase of about 60 per cent, the number growing from 25 to 40 during the season.

TELEVISION AS A FIELD FOR STANDARDIZATION

Standardization Essential for Future Development and Progress of the Art

By C. FRANCIS JENKINS

It will come as a surprise to many that television needs but little standardization, as compared with motion pictures, for example.

In motion-picture theater entertainment all the theaters of the United States, and many of those elsewhere, are equipped with a choice of but three makes of picture projectors. But these are served with films made in many cameras by camera men all over the world.

To insure the widest usefulness, obviously it was necessary that the common integral of the system, that is, the film, should be standardized, namely, as to width of film, size of picture frame, location of frame line, direction of picture-frame sequence, picture frames per second, and perforation of film (in shape, size, separation, location, and number per picture frame).

There were many other standards adopted for convenience and interchangeability, but none but film standards were absolutely necessary. Nor was time an element of consideration, for the film could be shown a day, a week, or a year after it was taken.

In television, however, time is the essence, for the person or scene can be reproduced only simultaneously with its broadcast, the station being comparable to the camera in motion pictures.

At present there are only a relatively few radio-vision broadcasters, and each follows his own inclination as to the elements which go to make up the treatment of his picture frame (scanned area). Some use as low as 24 lines per frame, some as high as 100 lines.

More television broadcasting is done (at the present time) on 60 lines per frame, 60 picture elements per line, and 20 frames per second than any other. The

scanning is done from left to right and from top to bottom in successive lines, as one reads the page of a book.

The present method of television, as is now rather well known, consists of an analysis at the broadcast station, and a simultaneous synthesis at all receivers, of the person or scene, in successive elementary picture areas delivered over a single radio channel.

The resultant assembly of the elementary picture areas remind one of the dots in a half-tone printing block—coarse screen for newspaper work, fine screen for book printing—with its different sizes of dots, and which, assembled in groups of like sizes, make up the blacks and whites and half tones of the picture.

One can imagine these thousands of dots transmitted and received one by one in orderly succession over a radio channel. It will also be understood that the finer quality of picture, with its greater number of dots, or elementary areas, all sent in a small fraction of a second, one-twentieth, for example, the higher is the frequency involved, and therefore the wider the radio band (in kilocycles), and that only. Therefore standardization of picture frame, as already explained, is all that is absolutely necessary.

It is quite obvious that if television reception is to be enjoyed by everyone from all radio-vision stations, then all stations must adopt a standard of analysis of the object or scene broadcast. Otherwise each household would have to buy a receiver for each broadcast station, or limit its reception to the offerings of a single station. The sooner such standardization is accepted and practiced by all interests involved the sooner a large and enthusiastic audience will be nightly receiving television entertainment.

WHEELBARROWS

The proposed revision of Simplified Practice Recommendation R105-29, Wheelbarrows, is now before the members of the industry for their consideration and written approval.

On April 26, 1929, a joint conference of representative manufacturers and users of wheelbarrows, held under the auspices of the Bureau of Standards, drafted a simplified practice recommendation which was accepted by the industry, and promulgated by the Department of Commerce as Simplified Practice Recommendation R105-29. This recommendation listed 41 sizes and types of barrows, and eliminated 84.

A revision meeting, held September 22, 1931, proposed a further reduction to 27 varieties. It also recommended that all steel-tray barrows be rated and catalogued according to cubical contents of the struck capacity, measured with dry wheat. To meet the need for a uniform terminology, it was decided that the wheelbarrows contained in the simplification program

should be designated S-1, S-2, etc., in order of their appearance in the list.

The revised recommendation is to be effective upon announcement by the Bureau of Standards that the required degree of support has been secured.

PUBLICATIONS ON TEXTILES

There has been issued by the Department of Commerce the third edition of the pamphlet entitled "Government Publications Relating to Textiles." This pamphlet lists all reported publications issued by Government bureaus dealing with the textile industry. In the present issue there are included the names of 23 Government bureaus which have issued publications relating to textile subjects together with a listing of these publications conveniently classified under various subject headings. Copies of this pamphlet may be obtained from the United States Department of Commerce, Washington, D. C., without charge.

CONTROLLING AIR TRAFFIC

Standard System of Air Marking by Cities, Towns, and Villages Recommended by Aeronautics Branch

By CLARENCE M. YOUNG¹

Airmen flying over any portion of the Federal airways system, which now covers a major portion of the Nation, constantly are receiving guidance and assistance from the communications system of the Aeronautics Branch of the Department of Commerce.

Their courses are outlined accurately by the rotating beacon lights and the beams of the radio range beacons. They are told by radio signals from marker beacons when to adjust their radio sets to receive the next radio range beacon as they near the limits of the beam they have been following. Weather information is furnished periodically by the airways communications stations working in conjunction with the automatic telegraph-typewriter circuits. Intermediate landing fields, lighted and marked for ready identification from the air both day and night, are nearly always within a short distance of the airmen.

The communications system of the Aeronautics Branch is so standardized that it matters not where airmen may be flying, they always will receive the same type of information pertaining to air navigation. Hence, by familiarizing themselves with the communications procedure in operation on any one section of the Federal airways system, airmen hold the key to the methods employed by the entire communications system of the Aeronautics Branch. That which follows may serve to illustrate this statement:

The airways beacon lights on the Federal airways rotate six times a minute and thereby show six flashes in that period. The beacon lights are located at standard intervals, 10 miles apart, and are established in series of 10 in 100-mile sections. The number of each beacon light on each 100-mile section is flashed in code by two red course lights placed on the tower platform. As the result of assistance rendered by the course lights, airmen need know only on which section they are flying to ascertain their approximate position along the airway. The red course lights, which signify the absence of landing facilities, are so installed that they point backward and forward along the course. Thus, airmen know in which direction they will find the next beacon light if the weather obscures it from vision. For day operations a concrete arrow at the base of each beacon-light tower points to the direction of the airway.

Beacon-light towers at intermediate landing fields carry green course lights instead of red. In addition to the beacon and course lights, an intermediate field is identified at night by the presence of boundary, approach, and obstruction lights and an illuminated wind-direction indicator. Standard boundary lights, installed at intervals of approximately 300 feet around the perimeter, outline the field. Green lights, installed in the boundary system, indicate the best approach to the landing area. Obstructions on or near the landing area are marked in all cases by red lights at the height of the obstructions to be cleared.

In daylight an intermediate landing field is identified from the air by a chrome-yellow circle at the intersections of the runway center lines, with chrome-yellow panels 20 feet long and 2 feet wide extending from the outside circle along the runway center lines to indicate the best landing directions. The boundaries of the field are marked by chrome-yellow sheet-metal cones 30 inches in diameter and 24 inches in height, installed immediately below the boundary lights and attached to the boundary-light standards. These markings and lights are standard characteristics of all intermediate landing fields established and maintained by the Aeronautics Branch of the Department of Commerce.

The radio range beacons, although of two types (aural and visual), are standardized in their methods of operation. Each type provides directional guidance by sending out signals that mark a course for 100 miles or more. These signals are received through earphones (for the aural beacon) and through an indicator on the instrument board for the visual type. One airway, at this writing, is being equipped with the visual-type transmitters, thereby providing identical radiodirectional service of this particular type for aircraft using this airway.

When an aircraft nears the limit of the range beacon course, the pilot is warned by signals from a radio marker beacon so that he may adjust his radio set to receive the signals from the beacon ahead. The marker beacons are also equipped with radiotelephone transmission equipment.

Aeronautical weather information is gathered and transmitted in accordance with uniform practices. The automatic telegraph-typewriter circuits first collect the data from Weather Bureau stations along the airways and at points about 200 miles left and right of the route. This material, together with the conditions prevailing at the automatic telegraph-typewriter station, is transmitted to the airways radiocommunications stations, which assemble, edit, and then broadcast it by radiotelephone to aircraft in flight along the airway. The information broadcast includes the correct time, the condition of the weather, degree of visibility, velocity of the wind, temperature, barometer reading, and other information of importance. These broadcasts are made at regular intervals, in some cases hourly, and in others on half and quarter hour schedules.

The position reporting of aircraft in flight over the airways is also conducted in accordance with uniform practices. When an airman leaves an airport and if he requests the position-reporting service, a message goes out over the automatic telegraph-typewriter circuit giving his name, license number of the plane, and point of departure and destination. This message is automatically reproduced on receiving machines at strategic points along the airway which note his progress. As he passes over these stations, messages to that effect are sent to stations backward and for-

¹ Assistant Secretary of Commerce for Aeronautics.

ward along the course, so that the approximate position of the plane may be known throughout the flight.

The standardization of communication facilities on the airways, however, is only one phase of these activities of the Aeronautics Branch. There are also the air navigation maps; the efforts in behalf of uniform field rules, signal systems, the certification of aeronautical lights, and air marking.

The airway strip maps are prepared by the Aeronautics Branch in accordance with standards recommended by the Board of Surveys and Maps of the Federal Government. The strip maps deal with the airways and show communities, highways, airports, streams, railroads, high points, transmission lines, and other pertinent data to aid the airmen in following those specific routes. Another type of map, the sectional airway map, covers a much larger area, but it includes the established airways and the same general type of information as is presented on the strip map.

In an effort to bring about uniformity in airport-field regulation throughout the United States, the Aeronautics Branch has prepared a set of suggested rules for adoption by airports and landing fields. These have been adopted by many airports.

Realizing that there exists an urgent need for the development of standard signal systems suitable for both day and night use, for controlling air traffic on and in the vicinity of airports, and for communicating special information to airmen, the Aeronautics Branch is conducting special research work on this subject in connection with its studies on airport-traffic control.

The primary object of this research is to assist in developing safe and efficient methods of controlling air traffic at airports and to bring about uniformity in their application.

To further safety in air navigation, the department requires that all aeronautical lights, other than those established and maintained by the Federal Government, be certified by the Department of Commerce as true aids to air navigation. In order to serve as true aids, such lights shall be long-range lights of

suitable design, shall be distinctly aeronautical in character, and shall have color characteristics conforming to the uniform standard used on the Federal airways. They also are required to be in reliable operation from sunset to sunrise each night in the year, to mark an airport or landing field, a route leading to an airport or landing field, or a point from which bearings may be taken leading to an airport or landing field, an outstanding landmark serving as an aid to air navigation, or an area presenting a hazard to flying.

The Aeronautics Branch has also drawn up recommended standards to be followed in the marking of obstructions to air navigation. Provision also is made for marking hazardous flying areas and for the certification of high-explosive danger areas, the latter upon request by the owners of such areas.

The Aeronautics Branch has been active in an effort to stimulate the general use of a standard system of air marking by cities, towns, and villages that will convey the necessary information to airmen in the simplest and most effective manner. A recommended system for general use in this country has been worked out as a result of extensive studies and service tests made by a special committee to study the subject.

The branch recommends that such markings be placed on the most outstanding buildings or structures when suitable roof space is available, and should include the name of the city or locality, a meridian marker, and, if there is an airport in the vicinity, a combination of simple characters indicating the direction and distance to the airport, its rating, and whether facilities are available for landplanes, seaplanes, or both. It also recommends a system for the marking of highways to aid the pilot in identifying them, as they stand out very clearly from the air and serve as one of his best landmarks.

Through the standardization of its communication facilities, the Aeronautics Branch has been of much assistance to the development of cross-country air travel. The system is being developed in accordance with well-defined plans and is being extended as rapidly as authorization and appropriations permit.

IMPORTED TEA MUST PASS STRICT TESTS

C. F. Hutchinson, tea examiner for the Federal Food and Drug Administration, has the job of making sure that all imported tea meets the standards of the national tea act of 1897, enforced by the Food and Drug Administration. "When you sip your tea," says Mr. Hutchinson, "you are justified in letting your mind run to romantic and exciting things."

He, however, confesses that he does not have much time to let his mind wander from business during office hours. He is too busy helping enforce the tea act, by which all teas entering the United States are judged as to quality, purity, and fitness for consumption. If a sample fails to meet these standards, Federal food officials refuse it entry into the channels of American trade.

The standards are strict, but importers are bringing in excellent tea. The tea standards are fixed by a board of tea experts chosen by the Secretary of Agriculture. That board is composed of Mr. Hutchinson, for the Government, and six other specialists representing the East, the West, and the interior. The board meets, selects, and submits to the Secretary of

Agriculture official standard samples by which all teas imported are judged. These standard samples are selected mainly by taste, although other things are considered.

SURGICAL DRESSINGS

A summary report of the general conference which approved a simplified practice recommendation for surgical dressings, has been mailed by the Bureau of Standards to all interests for their consideration and written approval.

The recommendation, which is based on a study made by the Hospital Research and Information Department of the American College of Surgeons, in cooperation with hospital executives, surgeons, manufacturers, and scientific laboratories, establishes nomenclature, sizes, and methods of preparation of sponges, abdominal packs, sterile gauze dressings and pads.

Subject to acceptance by the industry, the recommendation is to be effective one month after the day of the Bureau of Standards general letter announcing that the necessary degree of support has been received.

AMERICAN STANDARDS ASSOCIATION

Association Activity During November

The following current information concerning developments in standardization projects under the auspices and procedures of the American Standards Association, has been furnished by that association:

The secretariat for the international committee which the International Standards Association, in 1930, decided should be organized to discuss the possibility of arriving at international uniformity between national standards on nomenclature and methods of test of petroleum products has been assigned to the American Standards Association. An active start is now being made in organizing the committee. Invitations are being sent to all the member bodies of the I. S. A. and also to the three national standardizing bodies which are not members of I. S. A.; namely, the British, Canadian, and Australian organizations.

The British organization has already been in co-operation with the sectional committee on methods of testing petroleum products and lubricants which has been working under A. S. A. procedure, under the sponsorship of the American Society for Testing Materials.

The invitations which are going out to the national standardizing bodies contain a review of the work which has been done in America in this field, and a request that any national organizations interested in cooperating prepare a similar statement concerning the work that has been done in their countries, with the idea that such statements will furnish a basis for the program of the international project.

Symbols for mechanics, structural engineering, and testing materials.—The proposed standard on this subject has been submitted to the association for approval as American standard by the sectional committee on scientific and engineering symbols and abbreviations. This submission follows approval by the sectional committee and the five sponsors; the American Association for the Advancement of Science, the American Institute of Electrical Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the Society for the Promotion of Engineering Education.

Direct-current overhead-trolley construction.—The American Electric Railway Association, proprietary sponsor for the project, has advised the association that a revision of the American standard specification for 600-volt direct-current overhead-trolley construction is being undertaken. The work is being done by the power committee of the A. E. R. A.

Finishes of machine surfaces.—The American Society of Mechanical Engineers has requested that a

committee be organized under the procedure of the A. S. A. to consider the question of standardization of finishes of machine surfaces, and has offered to act as sponsor or joint sponsor, for the proposed project.

The establishment of a basis of measurement for the quality of finish of machine surfaces would make it possible to classify different machine finishes, to compare them, and to designate them on shop drawings and in specifications by a standard number, symbol, or term. The need for some kind of classification has been more particularly felt, in the last few years, by the manufacturers and users of grinding equipment. Quality designations, such as "rough," "commercial," "smooth," "fine," "mirror," "extra," "ultra," have been adopted by individual companies, but such terms are more likely than not to have a different meaning in each organization. Moreover, in so far as they are not tied down to measurable properties, they can be interpreted only by means of samples. Sets of such samples—also of finishes other than those which are ground—are actually used by several firms as a guide for their engineering, production, and other departments.

Quality of surface is, among other things, a major factor in the fitting together of parts. This applies in the first place to clearance fits, such as the fit between a shaft and its bearing, where surface quality influences the wear of the parts. The modern tendency is to give cylindrical parts which have to function under exacting conditions a good quality of surface finish before assembly, instead of following the old practice of letting them obtain such finish during a "running-in" period of the assembled machine. Surface quality also determines the maximum resistance which parts with a tight fit will offer to an effort to separate them. Furthermore, quality of finish is a matter to be considered in many cases where no problem of fit is involved, but where a certain appearance of the manufactured product is required. The problem applies to surfaces of all kinds—cylindrical, flat, or otherwise—and to the different kinds of machine finishes used in manufacturing practice. It also applies to finishes obtained by processes not involving the removal of metal, such as cold rolling or drawing, press finishing, etc.

If the A. S. A. standards council, upon recommendation of the special committee, decides that work on the project shall be started, the sponsor or sponsors will organize a sectional committee consisting of representatives of all major groups having an interest in the project.

NOTION AND MILLINERY PAPER BAGS

The simplified practice recommendation covering the sizes of notion and millinery paper bags has received sufficient signed acceptances from producers, distributors, and users to insure its general adoption by the industry, and may be considered effective as of December 1, 1931.

In February, 1931, four simplified practice recommendations, in the field of wrapping and packing sup-

plies as used in department stores, were approved by general conferences of members of the industry. The simplification program on notion and millinery paper bags is the final one of the group of four to receive the written approval of the industry. The other recommendations concern corrugated boxes, folding boxes, and set-up boxes.

The reduction in variety effected by this simplified practice recommendation is from 188 sizes of bags to 23.

WOOL AND PART-WOOL BLANKETS

General Conference Approves Commercial Standard for Labeling Contents of Blankets

A standard system of labeling wool and part-wool blankets, to show the percentage of wool contained in each blanket, received the approval of a general conference of all interests of the industry, held under the auspices of the Bureau of Standards in New York City on November 20.

The blanket industry, for quite some time, has realized the importance of adopting a standard of this character, and it is the belief of leading manufacturers and the merchandise managers' division, National Retail Dry Goods Association, sponsors for the program, that the commercial standard just approved by the conference will be mutually satisfactory to all concerned.

The purpose of the standard is to provide a nationwide method of labeling wool and part-wool blankets in order to protect the interests of the manufacturer, distributor, and consumer.

The term "part wool" as it is generally used in connection with mixed wool and cotton blankets is misleading in that it gives a consumer the impression that there is more wool in a blanket than actually exists, there being, in fact, at least 75 per cent of the blankets on the market labeled part wool that actually carry less than 10 per cent of wool and many only a fraction of 1 per cent. The customer seldom knows this, and the leading factors in the blanket industry, feeling that this practice is unfair and deceptive, offered a specification for incorporation into a commercial standard.

This specification as revised by the general conference states that a blanket which has less than 10 per cent wool shall not carry the word "wool" in any form; that the words "not less than 10 per cent, 20 per cent, 30 per cent, etc.," when used with the words "part wool" in advertising or tickets, shall appear in the same size type as the words "part wool"; that the percentage of wool specified shall refer to the fibers employed, and means the percentage of wool in the entire blanket and not in the filling alone; and that blankets containing between 10 and 20 per cent wool shall be labeled "part wool, not less than 10 per cent," between 20 and 30 per cent shall be labeled not less than 20 per cent, and so on in 10 per cent steps until a blanket containing between 90 and 98 per cent shall be labeled "part wool, not less than 90 per cent," and anything above 98 per cent shall be an "all wool" blanket.

The method used in the determination of the percentage of wool contained in a finished blanket shall conform to the methods used and approved by the Bureau of Standards.

This action, on the part of the industry, is in line with the recommendations made a few years ago by the National Better Business Bureau that the approximate percentage of wool content of the blanket be stated for the information of the retailer and customer. The approval of this standard marks another step forward by the industry to bring about a better understanding between the manufacturer, distributor, and consumer of this commodity. The industry has already simplified the variety of sizes of cotton, wool, and mixed cotton and wool bed blankets from 78 to 12, as published in Simplified Practice Recommendation

No. 11 of the Department of Commerce.

The formal adoption and use of the recommendations embodied in this standard will not entail any material changes in any branch of the blanket industry, as it simply means replacing all labels and tickets with others that conform to the commercial standard. For this reason the conference set the early date of February 1, 1932, as effective date for new production and clearance of existing stocks.

A report of the general conference, which

includes a revised draft of the proposed commercial standard, is being prepared for circulation among producers, distributors, and users for written acceptance.

As indicated editorially by the Daily News Record of November 25, "although the problem has been tackled by at least three 'outside' organizations, the move which finally bore first fruit was that which had been initiated within the industry itself; that is, at a meeting of retailers and manufacturers.

"The first blanket mill to offer a 'part wool' blanket, labeled according to the specifications approved at the Bureau of Standards meeting, should certainly be enriched with a valuable prestige and buyer endorsement, judging from the sincerity of purpose evident at that meeting of buyers and sellers." The writer then pointed out that "it was the first definite accomplishment in the direction of ridding the blanket industry of an evil which has been under fire from various agencies for the past six years and presents a unique merchandising possibility."

The standard as approved by the general conference is as follows:

"No finished blanket containing less than 10 per cent wool shall carry the word 'wool' in any form. The words 'not less than 10 per cent,' 'not less than 20 per cent,' etc., in the advertising shall appear in the same size type as the words 'part wool.' The wool content refers only to the fibers employed."

Blankets containing between—	Shall be labeled—
10 and 20 per cent-----	"Part wool, not less than 10 per cent."
20 and 30 per cent-----	" " " " " " 20 " " "
30 and 40 per cent-----	" " " " " " 30 " " "
40 and 50 per cent-----	" " " " " " 40 " " "
50 and 60 per cent-----	" " " " " " 50 " " "
60 and 70 per cent-----	" " " " " " 60 " " "
70 and 80 per cent-----	" " " " " " 70 " " "
80 and 90 per cent-----	" " " " " " 80 " " "
90 and 98 per cent-----	" " " " " " 90 " " "
Above 98 per cent-----	"All wool."

SEAL INSTILLS CONFIDENCE IN GAS APPLIANCES

American Gas Association Laboratory Seal of Approval a Guide in Proper Selection of Appliances

By F. R. WRIGHT¹

An accurate determination of the general utility of a gas appliance can not be made merely by a superficial inspection. This being true, the purchaser must depend upon the skill and good faith of the manufacturer in producing a satisfactory product, or be guided by a trade-mark, seal, or other distinguishing features. For years symbols of this kind have been guiding the buying habits of millions of people. For example, one buying an article of silver usually looks for the "sterling" mark, or if of gold, then to see whether it is stamped 14 or 18 karat. Likewise, the purchasers of gas appliances have come to depend on the American Gas Association's laboratory seal of approval as a guide in the proper selection of gas ranges, water heaters, and other domestic gas appliances.

This seal is the symbol adopted by the American Gas Association's testing laboratory, and is the visible evidence of compliance with the A. G. A. approval requirements. These requirements are nationally recognized basic standards for domestic gas-burning appliances. They are formulated and developed by leading gas engineers, health authorities, home economics experts, governmental bodies, as well as all interested and allied trade associations and technical societies, in both the United States and Canada. They were drafted primarily to insure safety in gas-appliance performance. They have also contributed materially to the development of the gas industry and the elimination of waste in production methods.

Every appliance which is approved must comply in every detail with the above-mentioned standards. The testing and certification of all types of domestic gas appliances is one of the principal functions of the laboratory. Compliance with these standards entails exhaustive and extensive tests covering both the construction and performance of every appliance submitted. Only upon full compliance with every requirement is the manufacturer permitted to affix the laboratory seal of approval to his product. This program assists the manufacturer in developing a better product and brings about standardization in essential features upon which the public can rely in selecting an approved appliance.

The latest A. G. A. list of approved appliances shows some 12,000 models of gas ranges alone, which are now approved by the American Gas Association. This list is published in booklet form on the first of each month, and shows all the appliances which carry the laboratory seal of approval.

The approval of a gas range involves compliance in detail with 159 separate requirements; 127 of these requirements cover the construction, assembly, and durability of the range, while 32 specify definite standards of performance, compliance with which can only be determined by extensive laboratory tests.

The A. G. A. requirements for gas ranges are too extensive to be outlined in detail, since they comprise

some 15 pages of printed matter. However, a summary of some of the more important specifications should indicate the thoroughness with which ranges are tested.

In the consideration of the requirements one point should be kept in mind, namely, that they do not specify definite forms of construction nor fix the details of appliance design and assembly. Consequently, a wide range of structural types, designs, and methods of assembly may be found in approved appliances of the same general classification. The reason for this is most evident, since to include such details would not only limit initiative, a very undesirable feature from the standpoint of the appliance manufacturer, but would also greatly retard development and preclude the embodiment of ingenuity of design and improvement. Consistent with the accomplishment of the desired purposes a constant effort has been made not to retard progress that would in any way effect economy, time, convenience, safety, or cost to the consumer.

The construction as well as the performance requirements apply equally to all types of ranges, except that modifications are made for alternate types of construction, such as open and closed top ranges. These naturally necessitate alternate requirements for the top section.

In determining the safety and durability of a range from the constructional standpoint every part from bolts to bases is carefully checked. Each sheet-metal piece is gaged to make sure that it is of, at least, the minimum thickness required for the purpose it serves. Every range is required to have a base of minimum strength and durability with joints securely riveted or welded, and capable of supporting without permanent deflection a load of 300 pounds applied on the top of the range. Legs must be detachable, interchangeable, and rigidly held in place. The sheets making up the oven and broiler bottoms, top burner boxes, and trays must be corrosion resisting.

To facilitate the housewife's cleaning tasks, oven bottoms, oven and broiler linings, as well as burners, must be easily removable. For added convenience, grates must be interchangeable, so constructed that they can not be inserted upside down and must not be bolted in place. The arms of the grates must extend well over the burner to accommodate a small vessel, yet must not interfere with complete combustion. They also must be beveled down to where they meet the top frame so that pans may be slid on and off without jar. Rack supports must not have exposed sharp edges and must be so constructed that they will prevent racks from tilting when partially withdrawn. Oven doors of the drop type are required to be counterbalanced to prevent breakage and must lie and remain in a horizontal position. They also must have a flat inside surface on a plane with the door frame to prevent pans from catching on the door frame. Doors are further required to open with an internal

¹ Publications editor, American Gas Association (Inc.), testing laboratory.

pressure not greater than 50 pounds. Another requirement specifies that flue collars must be so constructed that the products of combustion can escape in case a dish or other flat object is accidentally or intentionally placed over the flue outlet.

The insulating qualities of the oven and broiler are fixed by specifying a minimum thickness of insulating material or a width of dead air spaces, and their location. The inner linings must be so placed that if the space behind them is used for a flue way, it provides ample area for the passage of the products of combustion.

To prevent leakage, gas cocks are required to meet certain minimum requirements with respect to circumferential seal, bearing surface, and take-up. Similarly, manifolds into which gas cocks are screwed must have a sufficient thickness of metal to provide at least three and one-half full threads. Cocks must be so marked or placed that their "on" and "off" positions can be recognized at a glance. Oven gas cocks must be readily distinguishable from those for the top burners. Mixer heads and air shutters are to be so designed that a positive and easy adjustment is possible.

Top burners are required to be cast in one piece, while oven burners if not of 1-piece construction must be so assembled that there is no possibility of leakage. Oven and broiler burners are not permitted in the same oven unless the control of the burners is such that they can not be operated at the same time. All burners must be securely held in a definite position without bolts, yet must be easily removable. Provisions must be made for the ready observation of oven-burner flames. Where thermostats are used they must have a by-pass capacity sufficient to permit a minimum safe gas flow with the thermostatic valve closed. In addition, an adjustment oven pilot of substantial construction is required which must be securely supported to prevent accidental displacement so that positive ignition of the gas from the oven burner will be effected.

Performance requirements on a gas range are very largely devoted to safety, although other tests are made to insure an acceptable degree of efficiency and sufficient speed in the initial stages of cooking. In order better to understand the significance of the various tests, a brief description of types of test gases, pressures, and burner capacities will be given.

The gases used for test purposes are natural, coke-oven, and carbureted water gas. These gases are representative of practically all the types of city gases supplied throughout the United States and Canada, and have widely different heating values, specific gravities, chemical compositions, and burning characteristics.

The natural gas used has a specific gravity of 0.65 and a gross heating value of about 1.135 B. t. u. per cubic foot, while coke-oven and water gases have specific gravities of 0.38 and 0.70, and heating values of 535 and 400 B. t. u. per cubic foot, respectively. These gases are measured by wet test meters which are extremely accurate. The volume is corrected to standard conditions of 30 inches of mercury column pressure and 60° F., since the heating value determined by the Junkers type calorimeter is corrected to this standard. The gas pressures at which tests are made were established after a careful survey of gas pressure conditions existing throughout the entire country. There are

7.0-inch water column for natural gas and 3.5-inch for the two manufactured gases. These pressures have therefore been taken as standards for all tests, except additional combustion tests, which are made at 2.0-inch pressure with coke-oven gas and 4.0-inch with natural gas. The purpose of these additional tests is mainly to insure good combustion at standard burner ratings, where unusually low gas pressures are encountered.

Many of the requirements are based upon the assumption that a certain degree of speed in cooking operations is required. By establishing a standard of gas-burner capacities for all oven burners, and combining these capacities with a minimum efficiency requirement, a reasonable cooking speed is assured with all approved ranges. The standard capacities of gas-range burners, for the purpose of all tests, are defined as follows: Regular top burners, not less than 9,000 B. t. u. per hour; giant top burners, not less than 12,000 B. t. u. per hour; separate simmering burner, not less than 1,800 B. t. u. per hour; broiler burner, not less than 140 B. t. u. per hour for each square inch of broiling area; and oven burner, 10,000 B. t. u. per hour per cubic foot of oven space, where such space does not exceed 2.4 cubic feet. Where the volume of the oven is in excess of this amount, manufacturers have the privilege of specifying the rating, providing it is not less than 24,000 B. t. u. per hour.

During all tests for compliance with the performance requirements, gas ranges are not connected to a flue but must depend for satisfactory performance solely on the principles of design incorporated in them.

The most important performance requirement from a safety standpoint is the one which states that a gas range shall produce no carbon monoxide. In determining compliance with this requirement the gas rate to each burner is adjusted in accordance with the capacities specified above at normal gas pressure, and the air shutters are regulated to produce flames with well-defined inner cones. Samples of the products of combustion are taken with the burners operating at one-half normal pressure, normal pressure, and at one and one-quarter normal pressure. The same procedure is followed with both manufactured and natural gas. When testing the top burners for compliance with the above requirements, round pans 7½ inches in diameter are filled with water and placed centrally over the burners. A properly designed metal hood is placed over the entire cooking top, and pipes leading from the pans protrude through holes in the top of the hood so that steam generated during the tests will pass off into the atmosphere and not become mixed with the combustion products. The hood is so designed that the opening around these pipes can be closed off and all the products of combustion forced to pass through a single flue outlet in the top center of the hood. The burners are operated for a period of approximately five minutes, and samples of the products of combustion are taken just below the flue outlet of the hood, at the three pressures specified above. The samples thus secured are analyzed for carbon dioxide and carbon monoxide. The analysis of the combustion products for carbon monoxide is made by means of an iodine-pentoxide apparatus, which is accurate to 2 parts in 100,000.

Samples from the oven and broiler are taken over the same range of pressures. Where the oven and broiler are vented through the same flue and it is possible to operate both at the same time, they are tested together as well as separately. The samples are secured in a similar manner except that they are taken from the flue outlet of the range. In the case of a solid top range, where the products are vented into the flue of the range, the sample from the top burners is also taken from the flue outlet. Where the top burners are vented out a separate flue they are tested separately from the oven or broiler but where the top and oven and/or broiler are vented into a common flue from the appliance they are also operated together and must meet the same requirement. These tests are designed to anticipate the most extreme conditions of service ever encountered in the home.

Additional tests are made at 2 inches water-column pressure on coke-oven gas and 4 inches pressure on natural gas. The burners are adjusted at these pressures instead of at normal pressure, as used in other tests. Air shutters are adjusted to give the best flames possible to obtain. Samples are secured at the pressures specified above for these two gases in a manner as previously described. Thus a high degree of flexibility of performance is assured, with the result that approved ranges will operate safely and satisfactorily in any section of the country, if properly installed and intelligently used.

Safety from fire hazard is assured by the requirement covering floor and wall temperatures (see illustration), which specifies that the temperature on the walls 6 inches from the sides and back of a range and on the floor underneath it, must not exceed 90° F. above room temperature after the appliance has been operating for one hour at a gas pressure 25 per cent above normal, and with the oven temperature maintained at 550° F. During this test the most extreme conditions are assumed, since all burners which it is possible to operate at one time are in use, and pans of water are placed over the top burners. Therefore, with a room temperature of 75° F. the maximum allowable temperature either on the walls or floor at the termination of the test period would be 165° F. This insures a wide margin of safety below a temperature that would cause scorching of ordinary wall or floor materials.

Leakage of gas from the range piping or controls is precluded by a test at 6 inches mercury pressure, this being about ten times as great as the highest pressure usually found in the average house piping.

Many requirements apply to oven performance, such as heating capacity, thermostatic controls, oven and broiler heat distribution, etc. Oven and broiler heat distribution is determined by actual baking and toasting tests. Oven heating speed is determined by a test using a 400 B. t. n. water gas. The low heating value

and high specific gravity of this gas have a combined effect in reducing the rate of heat input and consequently the test conditions afford a very severe check on the heating capacity of the oven. Under this requirement the oven temperature is required to reach 500° F. within 20 minutes when operated from a cold start.

The oven heat regulator, or thermostat, is one of the most popular and convenient devices on the modern gas range. It is designed to maintain any desired temperature within the oven from 250° to 550° F. Its accuracy and performance are carefully determined under the requirements.

Other important safety requirements include tests of burners over a range of pressure for flash back, and back pressure causing leakage of raw gas, tests on top and oven burner lighters, and of various safety valves and controls. Cocks are required to have ample gas capacity, must not leak raw gas, and must be capable of injecting sufficient air into the burner along with the gas stream to insure good combustion.

The approval requirements for gas ranges, as well as for other types of appliances, are revised by the American Gas Association from year to year as progress is made in the utilization of gas, and the need develops for more stringent requirements. Such revisions are now in process to include additional tests, and to provide requirements for ranges using "bottled gas," and butane-air gas. A program of extensive research has been conducted for the past two years by the A. G. A. laboratory and the Bureau of Standards, leading to the development of revised and additional requirements for ranges.

The interest of the laboratory in maintaining and insuring compliance with the A. G. A. standards for all ranges bearing the approval seal is not relinquished upon completion of tests. Periodical inspections are made at least once each year, at the plant of the manufacturer, at his distributor's place of business, or on the premises of users. All ranges which have been approved must be manufactured so as to be identical with the model tested in order to continue to merit the seal of approval.

Thus the laboratory seal, although not a guarantee of quality in the popular sense of the word, beyond that specified in the requirements, is a symbol of safe and acceptable performance. It insures a degree of perfection in construction and performance that the manufacturer would never be in a position to offer by himself. Many of the tests require expensive and elaborate equipment that no one concern could afford to install. The laboratory, therefore, begins where the manufacturer leaves off, by aiding him in the improvement and standardization of his product, as well as rendering an invaluable service to the ultimate consumer.

AROOSTOOK POTATOES SOLD UNDER LABELS

Aroostook potatoes, graded, identified by the New England quality label, packaged, and advertised, were introduced to the Boston market at a dinner given in Boston in October. On this occasion two carloads of potatoes were distributed to the unemployed of the city.

The potatoes, which are graded to meet requirements more severe than those of the best State and Federal grades, will be sold in bags and boxes of such

a size as to appeal to retail customers. The "bakers" will be packaged in boxes, and those for other use will be sold in bags having mesh windows which allow the customer to see the product. The potatoes are not only graded but carefully cleaned of all dirt and dust.

All packages will bear the New England farm products label, which is a guarantee that the produce meets official State grades promulgated by the commissioner of agriculture.

LAWS FOR GRADING AND INSPECTION

Résumé of Some Legal Standards Adopted by Various States

By ROBERT A. MARTINO, Bureau of Standards

In recent years many of the State legislatures have followed the lead taken by the Congress of the United States in enacting laws establishing standards for and regulating the grading and inspection of commodities in both interstate and intrastate commerce.

One of the primary objects in enacting such laws is an attempt by the States to create more markets and to provide for a wider distribution of commodities produced within their boundaries, but the chief reason is, perhaps, to prevent deception and fraud on the buyer by the seller as regards the quality and grades of the goods so sold.

That the Federal Government is playing an important rôle in standardizing the grades of various commodities and regulating their quality and inspection is evidenced by the several acts which Congress has passed from time to time in connection with grain, cotton, tobacco, food and drugs, and other commodities which are bought and sold in interstate commerce.

Standards which are passed by Congress become official or mandatory standards the use of which are compulsory in the conditions specified by the law under which the particular standard is promulgated. Congress grants to the Secretary of Agriculture power and authority to enforce the provisions contained in the acts.

There are given below a brief résumé of the laws which have been passed by some of the States regulating the grading, quality, inspection, and sale of certain commodities. Provisions have been made in most State statutes for the issuance of official certificates and labels for use on graded and inspected goods. Most statutes make the official certificates acceptable in any court in the State in which they are issued prima facie evidence of the true grade, classification, quality, or condition of such commodity at the time of its inspection.

Fruit and vegetables.—California, Florida, Idaho, Louisiana, Michigan, and Texas are a few of the States whose legislatures have established standards and standard packages for the purpose of preventing deception in packing, grading, shipping or sale of fruits and vegetables.

Practically every State has passed laws establishing standard grades and standard containers for apples. Laws provide that every packed container of apples sold or offered for sale must bear on the outside the grade of the apples, name and business address of firm, company, or corporation doing the packing, and the same if repacked and date when such apples were first packed or repacked.

Two States (Michigan and Pennsylvania) have enacted specific laws providing standards of quality for grading, classifying, and packing grapes within the State. Grapes which are not graded and classified as to quality must be marked "unclassified" on the containers.

The State of California's law with respect to canned fruits states that fruits so canned and designated as "seconds" shall have the word embossed or lithographed in the tin of the top or cover of the can.

Acts establishing standard grades for the quality of potatoes have also been passed by the legislatures of the following States: California, Idaho, Indiana, Kansas, Michigan, Minnesota, Missouri, and North Dakota. The provisions contained in these acts conform in all respects to the requirements laid down by the United States Department of Agriculture.

Farm Products.—The secretaries or commissioners of various State departments of agriculture have been vested with authority by their respective legislatures to establish and promulgate standards for open and closed receptacles or containers and the grading and classification of farm products, by which their quantity, quality, or value may be determined; and prescribe and promulgate rules and regulations governing the marks, brands, and labels which may be required upon receptacles or containers for farm products for the purpose of showing the name and address of the producer or packer, the quantity, nature, and quality of the product, and for the purpose of preventing deception and fraud. The laws also provide that the standards for farm products shall conform to those established from time to time by Congress or the United States Department of Agriculture.

Arkansas, Florida, Iowa, Oregon, and Washington have enacted laws establishing various grades of eggs. Arkansas specifically provides that any person retailing cold storage eggs to the public shall mark said eggs in a sufficient manner so that the buyer may have knowledge of their being cold storage eggs by said mark.

The following States have passed laws regulating the grading, quality, and marking of these products: Arkansas, California, Colorado, Delaware, Indiana, and Kansas. In connection with the sale of "certified milk" a few of the State laws provide that it must conform to the methods and standards for the production and distribution adopted by the American Association of Medical Milk Commissions and must bear the certification of a milk commission appointed by a county medical society organized and chartered by the State medical society.

Flaxseed or linseed oils.—The States of Georgia, Indiana, Iowa, and Wisconsin have regulated the sale of flaxseed or linseed oil by means of legislative acts which state that oil so sold in these States must fulfill the requirements for purity and tests recognized in the United States Pharmacopoeia. Statutes also provide for the labeling of the oil.

Grain, hay, straw, etc.—Numerous States, including California, Colorado, Iowa, Kansas, Maryland, Missouri, Nebraska, New Hampshire, North Dakota, Oklahoma, Oregon, and Washington have adopted the Federal Government standard grades for grain, hay, straw, and other commercial feed stuffs, and have established methods for the grading and inspection and the issuance of official certificates in reference thereto.

Cotton.—Georgia, Oklahoma, and South Carolina have enacted laws stating that the official cotton standards of the United States as established and promulgated from time to time by the United States Secre-

tary of Agriculture shall be the official cotton standards of these States. Grading and inspection of cotton conform to the requirements contained in the Federal act.

Petroleum products.—In several of the States the standards relative to the quality, purity, and strength for gasoline, kerosene, benzine, and other petroleum products have commanded the attention of State legislators. No less than 14 States have laws with respect to standards for petroleum products and the labeling of containers containing these products. The standards and best methods of petroleum products adopted by all of these States are those which have been prepared and promulgated by the Bureau of Mines of the United States Department of Commerce, and the Federal Specifications Board.

Every label, mark, or brand must show that the gasoline conforms in all respects to the testing methods adopted and used by the Federal Government.

The Minnesota act relating to gasoline states that it must conform to the specifications set forth in the act and that certificates must accompany shipments made in bulk containing the following wording:

This is to certify that the gasoline covered by this sale has an "end point" of not over 450° and has been inspected and approved by the chief, oil inspection.
Signed _____.

This may also be stamped on barrels, cases, casks, or tanks.

Naval stores, paints, putty.—The States of Georgia, Iowa, Michigan, and Pennsylvania have placed on their statute books laws with respect to the sale within their States of naval stores, paints, and putty. The laws specifically relate to the manner in which containers of these commodities must be labeled in order to prevent deception or fraud on the purchaser regarding their nature or composition as well as the quantity in terms of weight or measure.

Mattresses.—In the interest of public health a few of the States have passed laws with respect to fillings used in mattresses and pillows, among which may be mentioned Delaware, Iowa, Maine, Michigan, Minnesota, and New Hampshire. The laws of each of these States pertaining to the selling of mattresses and pillows provides for labeling. They specifically require that each and every mattress or pillow sold or offered for sale, shall bear securely attached thereto and visible on the outside covering, a cloth tag with a statement showing the kind of materials used in filling said mattress or cover and whether the materials used in filling are wholly new or secondhand and indicated as such.

Maple sirup.—The State of Vermont has passed a law regulating the grading and inspection of maple sirup. The law provides for the license of a resident State maple sirup inspector to carry on this work. Maple sirup shall be graded and inspected in accordance with color and density standards established by the United States Department of Agriculture.

Municipal regulation.—The legislature of the State of Maine has given authority to the municipal officers of each town within the State when they deem it expedient, to appoint one or more suitable inspectors for the purpose of inspecting flour and sole leather which have not been inspected in this State according to law.

Inspection of flour shall be for the purpose of ascertaining its soundness; every package inspected shall be marked by the inspector "sound" or "unsound," as the case may be.

As regards sole leather, each inspector shall mark or stamp the word "Best," "Good," "Second quality," "Third quality," "Damaged," or "Bad," according to the facts in each case.

ANTHRACITE INSTITUTE LABORATORY

By ALLEN J. JOHNSON, *Anthracite Institute Laboratory*

The Anthracite Institute maintains at Primos, Pa., a completely equipped testing and development laboratory. Equipment which is submitted to the institute is subjected to an extensive series of tests to determine all factors which would in any way influence its desirability to its ultimate consumer. These tests are alike only in their completeness, as it is of course obvious that they must be arranged according to the nature of the equipment under investigation. Thermostats are, for example, tested in a room surrounded by conditioned air at controlled temperatures. By means of recording instruments, a complete record is secured of the number of operations of the thermostats, of their effectiveness in maintaining constant room temperatures, of its lag and other physical details.

Blowers and fans are tested in a standard tunnel designed for measuring the output for all given conditions of static pressure and motor speed. The arrangement also includes the necessary instruments for studying the operations of the unit, together with the power consumption of the driver motor.

The domestic stokers are subjected to a two months' investigation, which usually concludes about 50 com-

plete combustion tests under all conditions of operation and with all types of fuel. If the results of such tests indicate that they would be acceptable, satisfactory, and reliable for domestic use, they are listed as approved, and the manufacturer is authorized to use the institute's seal of approval, which so certifies.

An indication of the rigidity of the requirements may be gathered from the fact that approval upon approximately 50 per cent of the devices tested are withheld until such time as deficiencies in the machine can be corrected by redesign or further development. However, every effort is made to cooperate with the manufacturer in removing objectionable features in equipment submitted before flatly refusing to approve the same. This, of course, in some cases results in ultimate approval, whereas in others equipment is returned to the manufacturer without public comment.

Formal approval has been given by the Anthracite Institute to the following anthracite-coal-using equipment tested at the laboratory: Blower system, domestic stokers with and without ash removal, space heaters, service water heaters, thermostatic equipment, and vacuum cleaners.

STANDARDIZATION IN MATERIAL HANDLING

Lack of Standards in Manufacture of Material-Handling Equipment

By A. R. PRIBIL, *President, Saginaw Stamping & Tool Co.*

The development of conveyors and caster equipment has been in a way parallel to the development of our railroads. In the early days of railroading each line had its own standards in rolling stock, track gages, etc. When these individual lines were brought together into extensive systems, common standards had to be established in order that all equipment might be used anywhere on the system.

A similar evolution has taken place as regards conveyor and caster equipment. In the early development of this business, individual conveyor and track builders specified their own particular type of equipment which necessitated the production of a great variety of parts, in order to meet each individual requirement. This not only created a very difficult manufacturing situation, but has resulted in a very high maintenance cost to the user and in a great many cases has resulted in the furnishing of inferior parts at high prices.

Keen competition in practically every line of manufacture has made imperative cost reductions that do not sacrifice quality. This has been successfully met by the development of a modern line of material-handling equipment, including conveyors, caster equipment, and trucks, but at the same time the necessity of nationally recognized standards has been fully realized.

It is generally conceded that standardization means unified progress. Whether one is buying articles for himself or quantities of material, he likes to feel that he is getting good value for his money. The experience of both industry and Government purchasing agents shows that buying according to definite standards and specifications insures quality and saves money.

Therefore a careful survey of the situation was made; in fact, the matter was taken up with some of the principal manufacturers as well as with the Bureau of Standards. The result of these efforts, however, has not been satisfactory, since each and every manufacturer contested that his product was the proper specifications; therefore not much willingness has been exhibited to cooperate in arriving at standard specifications.

On account of the rapid increase in the use of conveyor and caster equipment, necessitated by lower production costs, it is very evident that the adoption of specified standards must be determined by the consumer or user rather than by the supplier. In other words, the demand is concentrated upon standard sizes, thereby promoting reduction of stocks, maintenance costs and assuring better service to everyone concerned.

As a matter of fact no individual conveyor-equipment manufacturer nor any group of them have established by agreement any definite standardization in this field. Such standards as do exist have resulted from the natural selection by a majority of conveyor

users from the wide variety of equipment designs offered. Present standards represent what has survived—survived because of superior merit and greater adaptability to existing conditions.

The economic result of any standardization is far-reaching in effect. The user pays less for his original installation because the equipment manufacturer is able to take advantage of volume production. The user is also able, by reason of the interchangeability of parts in his conveyor system, to reduce his stock of replacement units to a small fraction of that required when a number of equipment types were used. He pays less per unit for his replacement items and can depend on replenishing his supply on short notice. Thus his maintenance costs as well as his original installation costs are reduced, and he requires less valuable factory space for parts storage.

One of the most fertile fields in industry for the application of improved methods in manufacturing lies in the field of material handling, and of all classes of material-handling equipment the conveyor and the factory truck contain the greatest possibility in reduction in production costs. The owner of a manufacturing plant, his general manager, and the men who are charged with the responsibility of economical production of manufactured products find in the study of conveyor applications the key to greater saving and consequently greater profits.

In approaching the question of proper material-handling equipment, however, it is important to keep these principles in mind and give careful consideration to the necessity of handling, type of equipment required, and the cost of handling.

In general it is safe to say that when more than one man's entire labor is employed in handling material on trucks or moving it from one department or operation to another conveyor apparatus of some kind is necessary. However, much depends on the nature of the operations, kind of product, the time required for the operations, etc. It is not possible to lay down very many general rules regarding conveyor installations, as an investment which might produce the desired results in one plant, might be money wasted in another. Differences in products, methods, plants, policies, cost of manufacturing, etc., mean big differences in the amount which can be invested in conveyors of the type required, as production in the modern plant runs on wheels.

An inclusive survey of industry shows that the 4-inch I-beam track, the open-type 2-wheel ball-bearing trolley, and the 458 chain are by a wide margin the most common and most satisfactory equipment of this type in use to-day. They are the standards. Reducing the size of the track under 4 inches greatly increases the hangers and bracing necessary to obtain proper rigidity. Increasing the sizes of the I-beam above 4 inches rapidly increases its weight and cost, while with the ordinary factory construction the 4-

inch track can be made adequately strong and rigid with a minimum amount of hangers and bracing. Seventy per cent of all conveyors installed in the last six years carry wheels made by our company; 3,500,000 of these units have been furnished to conveyor users in all types of industry from coast to coast.

The same comments apply to industrial truck casters. Owing to the fact that each individual manufacturer has his own dimensions as to plates, bolt holes, and height there was only one course to pursue; that is, to make a listing of the principal manufacturers' dimensions and take an average to conform to equipment in most general use; also, to make them of a design and construction to meet practically every caster requirement and insure permanency of the product by means of lubrication and rustproofing.

Realizing the value of a rustproof product in marketing, our entire caster production is now Parkerized. This makes them rustproof. Parkerized casters for all classes of service have proven most satisfactory and this, together with efficient lubrication, greatly increases the life of these standardized products.

A great deal of missionary and sales work has been done on these standardized products, and statistics of many large manufacturing plants show that by the adoption of standard equipment great results can be obtained in production, service, and cost. As a matter of fact a large majority of users of this equipment have adopted standardized products with most gratifying results, all of which proves that we are correct in our contention that specified standards must be determined by the consumer or user.

CERTIFYING CANNED GOODS

Canned Vegetables Show Quality Through Self-Identifying Labels

By WELLS A. SHERMAN, *United States Department of Agriculture*

The fruit and vegetable division has two contacts with the canning and preserving industry, one of which is through the operation of the perishable agricultural commodities act in which the definition of a dealer is sufficiently broad to include all canners of fruits and vegetables whose products become a part of interstate commerce. Under the operation of this act canners are required to obtain licenses from the Secretary of Agriculture, which remain effective indefinitely upon the annual payment of \$10. Canners can avail themselves of the benefits of the act in case they purchase raw stock from other licensees. Since canners deal largely with local growers who are not licensed under the act they have relatively few opportunities to avail themselves of the rather prompt and drastic remedies which the law provides for violations of contract on the part of those handling fresh fruits and vegetables in interstate commerce.

A more intimate and important contact is expected to result from the authority conferred upon the department to inspect and certify the grade of canned fruits and vegetables on the request of any financially interested party and upon the payment of a reasonable fee, substantially as has been done for the shippers of fresh fruits and vegetables since 1917.

The initial appropriation is small and the grading of canned fruits and vegetables during the fiscal year 1932 will be limited both as to number of products to be graded and certified and as to number of points at which grading service can be had.

Provision is being made, however, to issue certificates of grade on the samples submitted by the canners themselves in which the department will not attempt to identify in any way the lot from which the sample was drawn. For such service on a sample of one dozen cans a fee of \$3 is charged. The first samples for grading were received almost immediately after the effective date of the law.

By sending frequent samples to the nearest point at which grading can be done the canner can keep

himself informed from day to day as to the actual grade of the foods which he is producing, the recognized grades for most canned vegetables being U. S. grade A (fancy), U. S. grade B (extra standard), and U. S. grade C (standard). If the goods fall below the minimum requirements of the standard grade, they are substandard, and under the requirement of the Mapes amendment to the food and drugs act there must appear on the label in bold type the statement prescribed by the Food and Drug Administration, "Below U. S. standard—low quality but not illegal."

When the canned foods are in the hands of the transportation company, a public warehouse, or other disinterested custodianship where the identity of the lot can be shown on a certificate and will with reasonable certainty be preserved until there is a change of ownership, persons employed or licensed by the Secretary of Agriculture for that purpose will sample the products and either perform the grading service or send them to the nearest point where this service can be obtained. For this combined work of sampling and grading the charge will be \$5 for each carload quantity of 1,000 cases.

Certificates of grade showing that the samples were drawn in accordance with the regulations of the Secretary of Agriculture and by a disinterested party, and that they were also graded by an employee of this department with the result that the products were found to be of a certain specified grade, should be valuable sales documents in the hands of the owner or broker so long as the identity of the lot to which the certificate applies is maintained. The industry now suffers a considerable expense and loss through the shipment of thousands of samples to possible buyers for cutting and inspection. It is believed that it will soon be found practical as well as economical to substitute inspection certificates for the actual samples of the foods.

SAUSAGE CASINGS TO BE UNIFORM IN SIZE

Standardization Program of Industry Restoring Buying Confidence

By S. P. WILD¹

In these times when "standardization" is the almost magic word of the day it is sometimes refreshing to remember the warning of Bernard Shaw—"Don't always do to the other fellow as you would have him do to you; his tastes may be different from yours." A certain amount of variety is, surely, the spice of life, even "standardized" variety. We do not all want the same size of anything—not even sausages, for instance.

Much as sheep may look alike to the layman seeing hundreds or thousands together on farm or range, we all know that they are not by any means identical. They vary in every conceivable way, and, quite naturally, the casings derived from them vary in size, both as to caliber and length. Variety is here the rule, and the early sausage maker doubtless took the casings as they came, wide or narrow, long or short, with no thought save for the taste of the sausage he was putting into them.

When the successful merchandising of sausage began to demand, as it does to-day, standard, rather uniform sizes for certain products, the art of selecting, sorting, grading, and merchandising casings was born, and it has grown until it is to-day a most exacting one. Constant improvement in methods and continually closer and closer selection and grading together with improved methods of gaging, make it possible for the sausage manufacturer now to demand, and get, natural casings in exactly any width he wants, down to the millimeter, and for other types or brands, other similarly exact sizes.

Time was when casings were classified into just three rather obvious sizes—wides, mediums, and narrows. The grading was done chiefly by eye, and "mediums," for instance, varied from casings just too narrow to be "wides" to others, appreciably smaller, that the grader decided were too wide to be "narrows."

To-day the grading is exact, guesswork being replaced by measurement on gages which make it possible to classify each piece with others of exactly the same width. The number and variety of gages is considerable, ranging from those which consist chiefly of a ruled bar across which the casing is drawn while its width is read from the scale on the bar, to much more complicated devices which measure automatically both the exact width and the length of the casing as it is drawn through.

Whatever the method of measurement used, casings manufacturers to-day are turning out their products graded so closely for width that the casings in each

bundle are "more alike than peas in a pod." And the latest step is a move by a large group of casings firms further to standardize their output by putting exactly 100 yards of selected sheep casings in each hank or bundle, regardless of caliber. Previously, the yards per bundle depended on the caliber or width of the casing, ranging from 80 for one size to 120 or 125 for other sizes. By that system the weight per bundle was about the same, regardless of width, but the buyer had to remember the differences in length in comparing prices.

One of the greatest improvements in casings manufacture developed in recent years is the adoption of the centrifuge in starting the cure. Using the same principle as the cream separator and the centrifugal

drier in laundries, these machines impregnate the casings with the curing agents, resulting in much greater speed of cure, less spoilage, and a nearly perfect uniformity. The result, of course, of the widespread adoption of this method is, again, better casings, more uniform, and cheaper.

As pointed out in Resolution No. 7, passed last August at the West Baden convention of the National Association

of Retail Meat Dealers, the sales value of casings produced in 1930 was nearly \$30,000,000—no small item in itself but noteworthy especially because it was some 25 per cent lower than in 1928. As a factor representing millions of dollars a year, casings are an item of importance to the farmer, in whose well-being the entire meat industry has a vital interest.

In addition to being a logical and natural container for sausages—logical because they are there to be had, "manufactured" by the same mother nature on the same American farms as the sausage meat that is to go in them—casings have the very definite value of being edible, and of retaining, in the sausage, a maximum of the real meat flavor. There is no question of the keeping qualities of good sausage properly stuffed in natural casings and properly handled.

Definitely standardized as they are to-day, both for size and quality, with years of research back of the production, handling, and packing methods—research and testing that is still going on, and that is bringing further improvements from time to time, like the centrifugal machine, or like the recent development of a new cleaning method of hog casings which eliminates the former fermentation period—casings meet, for sausage meat, the need of "standardized variety" and offers every one exactly the size and grade he wants, while catering to the many different requirements of the trade for different sizes and styles.

The National Sausage Casing Dealers Association states that the preliminary steps taken toward standardization already has partially eliminated market uncertainty and restored buying confidence. The standardization program of the industry provides:

1. After September 8, 1931, all selected sheep casings are to be put in hanks of 100 yards, regardless of caliber.

2. Starting September 8, 1931, unselected sheep casings, known as "cuts," will be put up in hanks not to exceed 125 yards.

3. In order to save additional labor costs, present stocks of sheep casings will be sold without change in present measurement for a reasonable time.

¹ Butchers and Packers' Gazette, Nov. 1, 1931.

INTERNATIONAL SPECIFICATION FOR SIEVES CONSIDERED

Review of the Development of Sieve Specifications in the United States

By L. V. JUDSON,¹ *Bureau of Standards*

Sieve specifications are of particular interest to industry. Many powdered or crushed materials are limited in their usefulness by their size as determined by a screening test. This subject is of particular interest at this time because of the formation of an American Standards Association technical committee² to consider this question and also because of the proposal of the International Standards Association to consider the adoption of an international specification for sieves used for testing purposes. Plans for the organization and work of the committee are now well under way.

In this country the first specification for sieves was for Nos. 100 and 200 sieves used in cement testing. Although these were designated in the specification as Nos. 100 and 200 sieves, they were more commonly referred to as 100 and 200 mesh sieves. The variation in mesh of the cloth was specified and the nominal wire diameter, but not the tolerance in wire diameter. The specification was indefinite in many particulars, and as a consequence the sieving results on one sieve were not necessarily comparable with those on another sieve supposedly conforming to the same specification. The interpretation of the specification by the Bureau of Standards was liberal, but up to November, 1911, no sieve had been tested which passed the 1904 specification. Somewhat later a group of nine special sieves was made at the request of members of the American Society of Civil Engineers. These were made from imported cloth, which the makers claimed as being made to conform definitely to this specification, and yet only five were found actually to conform.

In September, 1911, a group of Government engineers met in conference, considered the results of measurements of sieve cloth and proposed a new specification, including Nos. 20 and 30 sand sieves in addition to the Nos. 100 and 200 cement sieves.

The next development was the adoption of a sieving test for the No. 200 sieves. Owners of those No. 200 sieves which had been certified by the Bureau of Standards were sent standard samples of cement and asked to make sieving tests in accordance with instructions which accompanied the sample. Investigations were also carried out at this bureau, and as a result a sieving test was developed and incorporated in a revised specification for the standard No. 200 sieve, which was adopted by the Bureau of Standards, October 1, 1914.

By 1914 other industries had recognized the need of standard sieves and the question of a suitable specification was referred to the Bureau of Standards by the execution committee of the American Society for Testing Materials. The subject was given a thorough study and a conference of representatives of various scientific and technical societies, Government bureaus, and firms was called for April 20, 1916. The conference selected as preferable a series of sieves having a ratio of $\sqrt{2}:1$ between openings of successive sieves coarser than 1 millimeter, and a ratio of $4\sqrt{2}:1$ between openings of successive sieves finer than 1 millimeter. The details of diameters of wires, tolerances, etc., were left to a committee appointed to consider these subjects.

The work of this committee resulted in the so-called "1916 screen scale." The committee recommended that the sieves be designated by their nominal openings. The final specification was based largely on the nominal catalog dimensions of sieve cloth then on the market.

With the entrance of this country into the war, this question of sieve specifications was dropped until 1919, when the subject was again given a critical study. Amendments were then made to the previous specification, and the revised specification formally adopted in June, 1920, as the bureau's standard, the series being designated as the U. S. Standard Sieve Series. These amendments consisted in making the sieve openings an exact geometric series with the ratio $4\sqrt{2}:1$ used throughout the series regardless of existing sieves, in revising the wire diameters to give a regular increase in the ratio of wire diameter to opening throughout the series, in limiting the tolerances to percentage variations in the average sieve openings, the average wire diameter and the maximum sieve opening, and in the elimination of the word "mesh" in the designation of the sieve. Up to that time the designations by "mesh" or "No." were practically interchangeable, but since 1919 the sieves of the U. S. Standard Sieve Series have been designated by arbitrary numbers which approximate to a greater or less degree the mesh of the cloth.

Revisions in the tolerances were made in 1924, particularly in liberalizing the tolerance in the wire diameter, as it had been shown that if two sieves have the same size openings but different wire diameters the sieving results do not differ by measurable amounts. The same conclusions have been reached more recently by German investigators.

The same specification has been adopted by the American Society for Testing Materials, but with the recommendation that the sieve be designated by the nominal opening expressed in microns.

This article traces the development of sieve specifications in this country from the first specification in 1904 to the specification now in use. It indicates the experience which is back of the present specification, and points out some of the problems likely to be undertaken by the committee of the American Standards Association in preparing specifications on this subject.

¹ Temporary secretary, American Standards Association technical committee on testing sieves.

The author desires to acknowledge his use of a manuscript on the subject of sieve specifications by his former assistant, Mrs. M. M. Gardner, when preparing this article.

² Dr. L. T. Work, Columbia University, temporary chairman, American Standards Association technical committee on testing sieves.

This series of sieves is both theoretical and practical. It is theoretical in that it is based on nominal openings which progress in a ratio which is logical and reasonable; it is practical in that sieves are readily obtainable which conform to the specifications. Nearly 5,000 sieves have been certified at this bureau as conforming with this specification. The series is not restricted to one firm.

This specification has been very generally accepted by scientific and technical societies in this country as well as by laboratories and testing organizations. The

influence of this specification may be very definitely traced in a number of sieve specifications of foreign countries.

Not everything has been done, even in this country, in the line of sieve standardization, and some of these further steps will undoubtedly be taken by the new committee of the American Standards Association. Among the questions to be discussed are the standardization of the sieve frame, the best designation of the sieves, and the preparation of a specification for perforated metal screens.

PROGRESS OF STANDARDIZATION IN THE SOVIET UNION

Report of the Supreme Economic Council of the Soviet Union States That Standardization Must Be Completed in All Industries to Make Possible the 5-Year Plan in Four Years¹

The Supreme Economic Council of the Soviet Union has rendered a report to the Council of Labor and Defense (S. T. O.) on standardization in industry for 1931. The report points out the importance of standardization in industry for the solution of basic production problems, defines the scope of the output by approved standards, and reviews the dynamics of the yearly quantitative growth of standards and lists them according to the separate branches of industry.

Standardization, the report states, must play a decisive rôle in raising production to a higher technical level, in curtailing unproductive expenditures, in decreasing costs of production and, what is most important, in increasing the quality of production. Until January 1, 1931, the approved standards covered 36 per cent of the cost of industrial production; about 30 per cent of production costs was covered by compulsory standards. The number of approved industrial standards on January 1, 1928, was 360. By October 1, 1929, this number had increased to 700, and at the present time has reached 1,600.

In ferrous metallurgy the cost of standardized production constitutes 72 per cent. Seventy-five standards have been promulgated, of which 55 are compulsory. The approved standards for pig iron must naturally be subject to revision in connection with the building of great metallurgical units. Many stamps of Martin and Bessemer lithium metal remain from pre-revolutionary times. At present a series of projects for steel rolling mills are awaiting approval. These standards, together with the assortment for rolled metals signify the complete standardization of all the basic ferrous metals.

The number of scales of ready and rolled metals exceeded 5,000, and a new assortment will mean a decrease by 79 per cent as against pre-war standards. The present construction and mechanization of agriculture require a revision of the established standards and the creation of new ones. This work is already begun. Standardization of productive processes includes rails, steel bands, and steel for boilers and stamping. Standards have been projected for blast and Martin furnaces for the equipment of the metal industry, according to which the construction of the

furnaces in the reconstructed plants is being carried on.

In nonferrous metallurgy the cost of standardized production constitutes 40.3 per cent of the total; classification of metals and alloys 94.9 per cent; and technical processes 18.2 per cent. Standardization of assortment covers the chief nonferrous, semifinished products, and it is now important to establish standards of technical processes for quality in mass production. By the end of 1931 the percentage of costs of production regulated by standardization of technical processes will jump from 18 to 62.

In the coke industry 20 standards have been set up, the cost of standardized production constituting 50 per cent. The chief product (coke) has no standards as yet. The working out of standards for chemical apparatus has been started.

The anthracite industry has no standards; only temporary technical conditions exist, subject to further study. A special Institute of Norms and Standards was created for the anthracite industry to carry on research in the standardization of this field, and, in addition, in the planning and typification of finished mineral products, typification of underground transport, ventilation, lighting, equipment, etc.

In the peat industry there are no standards. The standardization of peat bricks, briquettes, etc., is proceeding slowly, since these questions have not yet been sufficiently investigated. Work in standardization of the peat industry has included all processes connected with peat.

For the purpose of mechanization the improvement and adaptation of a series of new machines is being carried on at an increased speed.

In the oil industry the cost of standardized production constitutes 50 per cent of gasoline products, illuminating and lubricating oils, fuel for boilers, and other products. In addition, standards have been established for tests for fuel oils and oil products, and instructions have been issued for testing oil products. Standards are being worked on for oil products and paraffin. As regards oil equipment, until now only standards for pipe lines have been established. Extensive work will be done in this field during the year.

Work in the standardization of the power industry has not been put on an organized basis.

¹ English translation of article appearing in the Apr. 15, 1931, issue of the Bulletin of Standardization, published in Moscow.

In mineral ores—in the field of mineral raw materials—only one standard has been established, for kaolin; 47.8 per cent of the cost of production of salt is standardized. Only separate measures have been undertaken to standardize equipment for geological exploration. Standardization of heavy and medium machine construction, of lathes and equipment, lags sharply behind the growth of the machine and construction industry. There are no standards for heavy machine construction; work is only just begun on this.

In medium machine construction standardization is concerned exclusively with the parts of general machine construction and instruments, and partly with textile machine construction. An extensive plan of development in this branch was laid out for 1931. The inconsiderable work in the standardization of locomotive and rolling stock construction is also mainly concerned with individual parts of general machine construction.

In Diesel construction they are working on questions of typification and coordination in the factories. There must be first of all a single name for parts in locomotive, rolling stock, and Diesel construction. Eight standards were set up for lathe construction (covering 44 per cent of production), dealing chiefly with standardization of parts duplicated in the construction of lathes, and, furthermore, mass production is envisaged for all these parts on the principle of their interchangeability. Standardization of instruments covers 17 per cent of the cost of production; these include drills and arm files; that is, instruments of very wide usage produced in huge quantities.

Standardization of agricultural machine construction was incorrectly arranged from both a political and a practical point of view, concerning itself only with the parts of agricultural machines and implements for horse-drawn machinery (19 standards) and completely ignoring tractor-drawn machinery. With regard to the wagon industry standards were established for the width of the wheel tracks, the diameter of the wheels, and one and two horse wagons. Work has only now started in the autotractor industry; till the present there were no special standards, and in the factories general standards of machine construction were used.

About 500 standards in shipbuilding have been and are now being ratified; a large part of them refer to materials, semifinished products, and separate parts. Standardization of power equipment for ships, typification of ships, and special equipment are not included.

More than 50 standards have been introduced in the electrical industry, touching, however, only 20 per cent of the products—incandescent bulbs, conduits and cables, insulating material, electric motors, telegraphic appurtenances, and telephone and radio apparatus.

Standardization in structural wood building, notwithstanding the existence of the Institute of Norms and Standards, is extraordinarily backward in meeting the demands of this industry. Only an insignificant number of standards have been put into final form. Standards of quality exist for almost all the old building materials, but not as yet for the new, which are very important in construction. Twenty-eight standards have been approved in the lumber and woodworking industry for lumber materials, covering 40 per cent of production. There are no standards for furniture and export materials.

Standardized products in the paper industry—rags, for the manufacture of paper, for printing paper, newsprint, writing paper, etc.—reach 38 per cent of the cost of production.

In the chemical industry the cost of standardized production constitutes 44 per cent. Work on the standardization of chemical apparatus has just been started. Of 140 products in the basic chemical industries, standards were approved for only 44 of them, including fertilizer, means of combating pests, and basic chemical products. The varnish and paint industries have standards for colors in dry and pulverized form but none for varnish and enamel. Of 208 products for aniline paints, only 37 are standardized in organic dyes.

For artificial fibers only temporary standards have been worked out for a variety of yarns and artificial silk, and work has begun for the development of standards for basic raw materials and chemicals. Twenty-eight standards have been approved for reagents, making the import of foreign reagents superfluous. Seventeen per cent of the wood-chemical industry is standardized. Standards in the rubber industry—inner tubes, hose and piping, insulating materials, sanitary and hygienic products—cover 36 per cent of the cost of production.

The cost of standardized production constitutes 45 per cent in the light industry. In the 60 per cent standardized fat industry, standards have been established for soap, glycerine, and candles. The match industry is standardized. In the glass and porcelain industry there is 73 per cent standardization in the production of plain window glass, bottles, druggists' apparatus, and household utensils.

Standards exist for 36 per cent of the textile industry in all materials in wide use; the raw material has been standardized—cotton, wool, and bast fibers. In textile machine construction standardization has covered the selection of the type of machines, and their basic dimensions and details. The leather industry has standards for hides, shoes, harnesses, etc.; the cost of standardized production constitutes 71 per cent. More than 130 standards have been established in the clothing industry, chiefly in work clothing and uniforms, covering 40 per cent of the cost of production. There are no standards as yet in the photo-cinema and optical industries.

On the whole, it should be stated that, notwithstanding certain achievements, standardization in industry is much behind our tempo; the standardization plan of the Supreme Economic Council was only 20 per cent fulfilled. Underestimation of standardization as one of the most important technical-economic factors, by the leaders of industry, was the cause of this.

No attention was paid in the working out and establishment of standards, either to the question of sequence nor to questions of technical-economic effectiveness. Consequently, many of the objects standardized were of secondary importance; due attention was not given to the leading branches of industry. In order to broaden and hasten the work of standardization the Supreme Economic Council of the U. S. S. R. transferred all the numerous committees on standardization, and the individual workers to the branch trusts for the creation of regular, official standardization agency in the organs of rationalization.

There are at present about 350 persons in the Supreme Economic Council engaged in standardization work. However, reorganization of this work has not given satisfactory results, chiefly because in the overwhelming majority of branch trusts and the republics' economic councils there is no clearly formulated bureau of standardization, and there is no system of standardization units in the largest factories and shops.

The huge tasks of reconstructing industry demand the development of standardization. This must be one of the most important factors in rationalizing industry and fulfilling the 5-year plan in four years. The plan of standardization in industry for 1931 fore-

sees the establishment of more than 3,000 standards covering the cost of production by 31 per cent. By 1932 the cost of production covered by obligatory standards will be about 45 per cent. The fulfillment of this tremendous task requires an intensive tempo and mass work on standardization.

The realization of standardization in the shortest possible time in all branches of industry, and first of all in the leading ones, is a responsible political problem. The solution of this problem depends on how quickly the intensive work in industrial standardization is fulfilled by the directing and planning organs of industry and by all workers and engineering and technical personnel.

STANDARDIZATION OF LANGUAGE

Standardization of the Language of the United States and Canada During the Past Three Centuries One of the Astounding Phenomena of History

By THOMAS A. KNOTT¹

Language, consisting of words of various functions, usually interconnected and arranged in a purposive order in sentences, and uttered with an intonation that directs them to their purpose, has apparently, from the most primitive stage of human society, been a highly conventionalized instrument for the conveying of emotions, thoughts, information, commands, and questions. Its very function has required conventionalization, for the conveying of a thought or a command from one consciousness to another demands that the word or sentence should possess the same (or nearly the same) meaning for the hearer that was intended by the speaker.

There is, however, an almost incredible distance between the merely conventionalized speech of a tiny, isolated, illiterate clan of hunters or nomads or crop raisers, and such a standardized international language as Latin or Arabic in their day, or English or Spanish to-day. This distance has been bridged by certain steps that may be outlined (not always in a strictly chronological order) as follows: (1) The growth of moral conduct, resulting in security for life and property; (2) the development of industry, business, and commerce; (3) the creation and distribution of wealth; (4) the more general attainment of leisure; (5) the spread of education, resulting in the social freeing of potentially brilliant leaders; (6) the development of literature and the arts; (7) the study and application of science; and (8) the development of communications, especially the development or creation of the road, the ship, the railway, the printing press, the telegraph, and the radio. Most of these steps, however, are merely prerequisites. The really essential factors are education, literature, the printing press, and easy transportation.

Easy transportation, with the resultant constant moving about and general intermixture of nearly the whole population, is the basic reason for the general uniformity of pronunciation throughout the United States and Canada, so that it has even been said (in spite of some slight peculiarities in the Northeast and Southeast) that there are no dialects in this country.

During the period when our population has been growing from 3 million to 120 million—a century and a half—there has been hardly a child who grew up without changing many or most of his playmates, either through moving, himself, into a new neighborhood or State (often more than once), or through the moving of his friends. Since most individuals form their pronunciation habits before they are 15 years of age, through imitation of their associates, this generalization of personal contact has caused a great leveling out of local speech peculiarities.

Another factor of the greatest importance has been the public school with its accompanying agents of instruction—the teacher and the textbook. It is impossible to overestimate the influence of such books as McGuffie's readers on the common vocabularies and ideas of the pupils, or of Noah Webster's blue-backed spelling book on their spelling, or of the school dictionary on their understanding of meanings and on their common pronunciation during the formative period of our national life.

A third contributing factor has been the low-priced newspaper and magazine, both of them for the most part using language of a high type and dispensing floods of information of great value in increasing our common stock of words and information. As a result chiefly of the influence of these factors, the standardization of the language of the United States and Canada during the last three centuries has been one of the most astounding phenomena in all the history of language.

One hundred and thirty million descendants of Britons, Irish, French, Dutch, Germans, Spanish, Scandinavians, Russians, Italians, Poles, Finns, Lithuanians, Greeks, Syrians, and American Indians are to-day reading, and to a reasonable extent speaking and writing, the language of Thackeray, Dickens, and Hawthorne. Contrast this with what happened within a few centuries (possibly only five) to the various branches of the Indo-European speech when it was carried by migrating little tribes, of a few thousand persons each, from eastern Europe to India, Greece, Italy, and Scandinavia, to become such mu-

¹ General editor, The Merriam Webster Dictionaries.

usually unintelligible languages as Sanskrit, Greek, Latin, and Gothic. The explanation is obvious. The groups of Indo-European migrants lived isolated from one another and without the conservative influence of a written (or printed) literature.

So much for the language as unconsciously acquired. But when it comes to the realms entered in the higher schools and the professions, the situation is strikingly different. Here we meet subjects and sciences like mathematics, chemistry, psychology and botany, more than a score of them, each one with a highly conventionalized or deliberately standardized vocabulary of its own, achieved as a result of centuries or decades of careful, exact thinking and efforts at the most precise expression. The younger and less explored the field of a science, it is true, the more likely its terms are to change their meanings. Sine, hydrogen, obovate however, are settled, whatever may result from our latest explorations into parallel lines, atoms, behavior, or cells.

Nor can too much credit for standardization on a high level be given to the deliberate, conscious labors of the continuous stream of professional writers, from Chaucer to the latest bud of a novelist. From generation to generation they have learned the methods and achievements of their predecessors, and each generation has added its contribution to the style and technique of both poetry and prose. The effect of their work is cumulative. We still read Shakespeare, the King James Bible, Addison, Swift, and Fielding, and model our language on theirs in both speaking and writing. This is one result of the miracle of the printing press, with its low-priced product. Five hundred years ago, in the day of the hand-written manuscript, a 300-page book cost the equivalent of \$750.

To-day, in the industries and sciences, especially in some, where the terminology has been especially chaotic, we are witnessing a new kind of deliberate effort to secure standardization. Paint, textile, and

dye manufacturers are groping their way toward agreement on the meanings of names of colors, although not officially. The Anatomical Society has adopted nearly 5,000 terms (all in Latin), covering practically every term used in human anatomy. The International Botanical Congress has adopted an International Code of Botanical Nomenclature (devoted to scientific names only). The National (American) Advisory Committee for Aeronautics has adopted nearly 500 official terms and definitions. The International Research Council and the National Academy of Sciences have published the International Critical Tables for Numerical Data, Physics, Chemistry, and Technology. The Society of American Foresters has published Forest Terminology, with more than 1,800 definitions. And committees on nomenclature are active in many other associations.

What has been said above, however, about the changing meaning of such terms as "atom" and "cell" should warn us against too much confidence in the possibilities of achieving absolute or permanent standardization. Highly valuable as most of the work of standardizing terms has been and will be, we must remember that our scientific vocabulary can be fixed with complete finality only when our sciences no longer have anything in their fields to be investigated or discovered.

The same observation may be made on all the other phases of our practical and intellectual life. The meanings of many words, such as "matter" and "heat," were thoroughly understood 25 years ago, and to-day nobody understands them. When some of us were boys, there were no airplanes; there were only Darius Green and his flying machine. There were no radios or automobiles or garages. Not long since the author overheard a 10-year-old boy, in an old-fashioned New England village, especially preserved near Springfield, Mass., say to his father, "What is a blacksmith shop for?"

Our civilization and our language are changing.

A. S. T. M. COMMITTEE ACTS ON RUBBER INSULATION STANDARDS

Several important actions affecting standard specifications were taken at a meeting of the American Society for Testing Materials committee on rubber products, held on November 5, 1931. New performance specifications for rubber-insulated wire were presented to the committee by the subcommittee on insulated wire and cable. At present the A. S. T. M. has in force specifications covering two classes of insulation compounds. One of these, termed the type-A compound, does not contain organic accelerators nor antioxidants. In the other, called the type-AO compound, use of accelerators and antioxidants is permitted. Both of these specifications are of the "materials" type.

In the new specifications no requirements are included as to composition of the rubber compound, the quality of which is evaluated solely on the basis of test results. This insulation is designated as the performance-type compound. The committee voted to accept the new specifications and to recommend their adoption by the A. S. T. M. as an appendix to the present tentative specifications for insulated wire and cable. It is felt that by such action the A. S. T. M.

will be taking an important step forward in the preparation of satisfactory rubber-product specifications.

New specifications for friction tape were presented to the committee meeting by the subcommittee on insulating tapes. In these specifications the requirements are definitely made more strict, and important changes are given in the methods of test, which are presented in considerably greater detail. The present weight requirements are removed and minimum yardage per roll is specified. The committee voted to accept these specifications and to recommend that the A. S. T. M. withdraw the present standard specifications for friction tape for general use for electrical purposes, adopting the new specifications as tentative standards. Revisions were also offered in the tentative specifications for rubber insulating tape, which the committee will recommend for adoption by the A. S. T. M.

The meeting gave considerable attention to plans for making its service more valuable to industry. An open discussion emphasized the opinion that in the present state of the industry less attention should be given to the preparation of detailed material specifications for rubber products and that the committee should actively devote its efforts to standardization of test methods and development of performance specifications. This policy was recorded by a formal vote.

LEGAL ASPECTS OF STANDARDIZATION

Legal Issues Involved in Buying and Selling Under Statutory Standards Reviewed

By JACOB P. ARONSON¹

The efforts of private associations and governmental bureaus to further the recognition of standardization and grading as minimizing, if not solving, some of our most troublesome marketing and buying problems, have been aided in recent years by a large body of State and Federal legislation.²

Thus far, whether because of the dominant rôle of the farmer in American Government, or the comparative simplicity of standardization in the field of basic raw materials, or the need of a definite basis for large-scale trading, statutory grading provisions have been largely, though not exclusively, confined to grain, cotton, fruits, and vegetables. The statutes generally either adopt the grades established by the United States Department of Agriculture pursuant to Federal statutes, or themselves fix the grades, or delegate that power to an appropriate State agency. Provision is made in most statutes for the issuance of official labels for use only on graded goods.

The size of containers is often set out in great detail. Inspection service, either under the auspices of the State alone, or in cooperation with the Federal authorities, is generally provided. The inspectors are usually required to issue certificates setting forth the grade and condition of the commodity inspected, as well as other information. These certificates are given weight as evidence in all States.

The value of these statutes becomes apparent when we realize that to an increasing extent contracts for the sale of goods are being made long before delivery is required, and by parties separated by great distances. Transactions entered on the basis of description only, without even a sample of the article contracted for being shown to the buyer, flourish. Obviously some assurance is required on the one hand that the goods, when shipped, will conform: on the other, that if they do they will be accepted. While private cooperative efforts to fix grades and otherwise to solve this difficulty have been and are of great value, they do not possess the authority of statutory provisions, and their restriction to small areas greatly lessens their efficacy in a state-wide or nation-wide market.

When buyer and seller, availing themselves of the facilities provided by one of these grading statutes (which for the most part are merely permissive), have specifically agreed upon Government inspection (just as where a provision is made for inspection by a private party) the certificate issued by the chosen inspector must show that the goods conformed to the contract. When this appears, a buyer refusing to accept the goods is liable to the seller for the contract price or damages.

The only defense available to the buyer (on the question of conformity of the goods) is fraud, in which the

seller is usually required to have participated. If the certificate shows on its face a noncompliance with the contract, the buyer is entitled to reject it. That the goods do in fact conform, and that the certificate is a mistake, is no answer. However, where no specific provision for Government inspection is made in the contract, but the seller tenders an official certificate which states that goods conform, the buyer is entitled to produce evidence to the contrary. It is interesting to note that the fact that the certificate has been issued under the auspices of another State has been held not to lessen its weight, and that several of the State statutes expressly give the same validity to Federal certificates that they do to their own.

The general consensus of opinion is that these grading statutes are establishing a broad basis for intelligent dealing, with misunderstandings about grades, unjustifiable rejection in a declining market, and the shipment of nonconforming goods when the market is climbing, all reduced to a minimum.

There is, in addition, a body of compulsory standardization statutes in most States, which are designed to protect the purchasers of fertilizers, stock feed, seeds and certain other articles, the quality of which it is peculiarly difficult for the buyer to discover by his own examination. Submission of samples for chemical analysis by the State is made mandatory, with stringent provisions as to the information to be divulged by the label. Some statutes provide in addition, for the grading of fertilizer and feed.

These enactments, which are similar to the pure food laws of the United States and the several States, give rise to legal problems different from those discussed above. As violations of the statutes are made penal offenses, under ordinary principles of contract law, contracts calling for a performance not in compliance with the statutory requirements are void. This is true even though the statute does not specifically so provide. Consequently, neither party can sue upon an agreement containing a clause which precludes conformity to a mandatory grading, inspection, or labeling statute, and a waiver of such conformity is nugatory. And it is settled law that a seller who has not complied with the statutory requirements can not sue on the contract. Where the contract is still unperformed, the buyer is privileged to abrogate it or to reject performance when tendered by the seller.

It is obvious that the seller's obligation as to the goods and the buyer's remedies for breach thereof are materially affected by the labeling and analysis statutes. Under the uniform sales act, there is an implied warranty that the goods are fit for the particular purpose for which they are bought, where (1) that purpose is disclosed to the seller and (2) his skill is relied on by the buyer in making the purchase.

There is a conflict in the cases as to whether the statutory requirement that the ingredients be set forth

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² The statutes are collected and discussed at length in *Statutory Commodity Standards* (1931), Columbia Law Review, p. 872.

on the label imposes an additional obligation on the seller, or whether that provision merely supplants the warranty of fitness for a particular purpose imposed by the uniform sales act.

Another view which has received some support is that the buyer's remedy where the seller has not complied with the statute is different and apart from that ordinarily given for a breach of warranty.

MILITARY COMMUNICATION SYSTEM EMBODIES STANDARDIZATION

Standardization of Army Personnel, as Well as Equipment, Highly Desirable

By Capt. FRED G. BORDEN, *Signal Corps, United States Army*

Probably in no form of human activity is standardization more essential than in military organizations. Wars usually occur suddenly and without warning. After war is declared there is no opportunity to arrive at logical decisions as to training, equipment, and similar matters. These must be decided in times of peace when time is not so vital and when opportunities permit.

The Signal Corps is charged with the purchase, storage, and issue of all items of signal equipment for the Army which are of a commercial type, and is also charged with the development, purchase, and issue of noncommercial types of communication equipment not only for its own use but for the use of all other arms and services. Perhaps an example of the methods followed in perfecting a new type of communication equipment might be of interest to readers of *COMMERCIAL STANDARDS MONTHLY*.

We will assume that it becomes apparent that a motor vehicle capable of laying and recovering field wire has become necessary. This vehicle will be used not only by the Signal Corps, but by the Infantry, Field Artillery, Cavalry, Coast Artillery, and perhaps other arms. A study is made in the office of the Chief Signal Officer to determine the necessary characteristics of a vehicle which will most nearly fulfill all of the requirements of the various using arms. A tentative set of military characteristics is compiled and copies forwarded to the chiefs of the using arms for their comments and recommendations.

The chiefs of the arms usually submit this tentative list of military characteristics to their respective service boards, composed of officers of long experience, and the duty of each board is to examine the characteristics of the vehicle from the standpoint of its use by their particular arms and to forward the board's recommendation to its chief of arms, who furnishes a copy to the Chief Signal Officer.

After all of these recommendations have been received they are coordinated, and the military characteristics of the vehicles are reviewed to include such changes as seem practicable and necessary. Vehicles of the revised type are then obtained and sent to the various using arms to permit extended service tests in the field. The results of these service tests are included in reports which reach the Chief Signal Officer through the chiefs of the respective arms together with their recommendations.

Very possibly some minor changes are recommended, and these are again coordinated by the Chief Signal Officer and additional vehicles obtained, including as far as practicable, the recommended changes.

Frequently these are again given a thorough field test to insure that they will reasonably fulfill the military requirements. Detailed specifications are then prepared and submitted to the War Department for final approval and for the adoption of the vehicles as a standard type. The vehicles are then purchased in quantity, within limits of funds available, and issued to the using arms. While the procedure described might be considered as requiring too many steps, yet the necessity for providing an article which we may be confident will perform its necessary function during the various phases of combat will not permit of any considerable curtailment.

Standardization is essential not only to insure the suitability of the particular piece of apparatus but from other standpoints as well. For example, wire communication in combat units is usually furnished by means of twisted-pair insulated wire laid on the ground, since this is the only type of construction that time will permit. Wire used for this purpose must have certain characteristics which are not necessary for wire used for commercial purposes.

For example, the wire must lie flat on the ground to permit foot troops and vehicles to pass over it easily.

Furthermore, the wire must have sufficient tensile strength to permit its being laid from a rapidly moving animal-drawn or motor vehicle without the probability of its breaking under a sudden strain. In order to fulfill these requirements, the conductors must be composed of strands of fine wire of a special type of steel. A study which has been made indicates that there are not enough stranding machines in the entire country to furnish the amount necessary for our needs in the case of an emergency. Under these circumstances another type of wire which is used commercially and which can be readily obtained must be adopted as a substitute standard in spite of the fact that it does not entirely fulfill the above requirements. This commercial wire is used to supplement the supply of standard wire.

There are two entirely different methods which might be followed in developing a standard type of communication equipment: the first is to base the standard on performance specifications; the second, by definitely designating the exact size, weight, and other characteristics of each individual part, on detailed construction specifications.

As an illustration let us consider a radio set. By completely designating the size and weight of the set, its required range, the frequency on which it will operate, the type of signals which it will emit, etc., it is possible to obtain, under performance specifications,

sets with identical performance characteristics. Such sets can communicate with each other and to this extent might be considered as standard. In practice, however, the results are unsatisfactory, since by law the Signal Corps is obliged to buy equipment from the lowest responsible bidder.

Performance specifications might be satisfactory if only one order were ever contemplated, for in that case all sets would be identical in all component parts. Should, however, an additional quantity of a similar equipment later become necessary, it might be found that a different concern is the lowest bidder, and therefore receives the contract. His product would meet all performance requirements, but the component parts would not be interchangeable with the components of the sets originally purchased. A single set of instructions for the operation and maintenance of the two differently constructed sets would be impracticable and the time required to train personnel for such operation and maintenance would be greatly increased. On the other hand, provided complete detailed construction specifications, including drawings of each component part, are furnished to bidders, the product of one factory will be identical with that of another, and any component part of any set may be substituted for a defective part of any other set of the same type. Also the problem of training is greatly simplified.

The preparation of detailed construction specifications for such a complicated piece of apparatus as a transmitting and receiving radio set requires many weeks or even months of effort by highly qualified technical experts and the time required to complete the development of such a set is necessarily considerably increased, but by this latter method only can the Signal Corps be assured that its communication equip-

ment for war will be standard in every sense of the word.

During peace time the Signal Corps is responsible for the operation of post telephone systems, radio stations in the Army, and corps nets and similar peacetime activities. As regards wire communication the policy is to follow the best commercial practices. These practices are standard throughout the United States and have been evolved after many years of research and actual functioning. Standards as adopted for use in connection with the installation and maintenance of peacetime radio sets have been worked out partly by following the latest commercial developments and partly by experience gained by the Signal Corps in the actual operation of extensive radio nets.

The above discussion refers to material only, but in the Army it is necessary that standardization be effected for personnel as well. The large number of men involved, the necessity for immediate action, and the requirement that a military organization act as a unit necessitates standardization of the men who compose the organization. This is usually termed "discipline," but since the object of discipline is largely to insure that different men will react to similar orders in a similar manner the effect is standardization pure and simple.

From a communication standpoint radio operators are standardized as regards speed and the use of certain specified code signals. Telephone operators are taught a standard method of operation for the various switchboards. It is undoubtedly true that standardization of personnel is more nearly universal throughout a military organization than in any civilian activity.

WAXED TISSUE PAPER

Having received the required degree of support from the industry, the simplified practice recommendation for waxed tissue paper (S. P. R. No. R125-31) has been promulgated by the Bureau of Standards as one of the series of programs developed by industry, and will be considered effective as of November 1, 1931.

Waxed paper covered by this recommendation is paper treated with paraffin wax in order to fill the pores of the paper to make it resistant to moisture and to odors. Its principal use is to protect food products from dust and vermin. The familiar bread wrapper is a typical example. The estimated total value of the annual production of waxed paper is \$25,000,000. The volume exceeds 250,000,000 pounds per annum.

The program will establish uniform qualities of raw stock for this material and will eliminate many unnecessary sizes of sheets and lengths of household rolls.

Of special interest is the recommended elimination of the 400-sheet ream, which has been in use in at least one section of the country. The elimination of inferior quality papers and wax will insure a better product to the consumer. Concentration on the reduced number of sizes will be of assistance to the manufacturer in improving his products and rendering better service to the distributors and users.

FOUNDRIY PATTERNS OF WOOD

Much interest was shown by the makers of foundry patterns in a recent survey on Commercial Standard CS19-30, Foundry Patterns of Wood. This standard specifies definite colors for painting various parts of foundry patterns to assist the molder in preparing correct molds and avoiding errors in castings.

Replies were received from 393 makers, which indicate that 65 per cent (unweighted) of the pattern production reported was marked in accordance with the commercial standard. Benefits from the establishment of this commercial standard were reported by 259 firms.

A number of suggestions for changes and additions in the standard were received, and were included in a report to the standing committee, which consists of interested makers and users of foundry patterns, and whose duty it is to consider suggestions for revision. The recommendation of this committee was that the standard be reaffirmed for another year, without change, and that certain of the suggestions be considered for inclusion in a revision to be undertaken at a later date. It was felt that conditions do not warrant undertaking a revision at this time.

As recommended by the committee, notice of the reaffirmation has been circulated to all interested makers and users of foundry patterns, together with a summary of the results of the survey.

TELEGRAPH-COMMUNICATION SERVICE

Standardization of Equipment Has Served the Telegraph Business With Excellent Results

By C. E. DAVIES¹

In telegraph-communication service standardization of equipment and operating practices has come because of constant effort to improve accuracy and increase speed. Reduction of expense has, of course, followed as a natural consequence.

Within the past few years the average time required to handle telegrams has been greatly reduced. This has been accomplished by decreasing the standard time limits established for each operation and by intense supervision of thoroughly trained employees, who work with greatly improved apparatus. Improved standard forms of transmission and routines for handling corrections have also been responsible for faster speed of service.

Inspection of several modern telegraph offices would impress an observer with the fact that the apparatus and general arrangement in all offices is essentially uniform, and that the employees all follow the same general procedure in the performance of their respective tasks. This is the result of painstaking research to discover and apply the simplest, most efficient methods of handling telegrams, and to provide equipment and office layouts that eliminate as many unnecessary operations as possible.

One of the major factors in improving the speed of service has been the rapid development and standardization of the printing telegraph. Replacing the Morse method of telegraphy, it has not only increased transmission speeds, but has considerably reduced the uncertain human factor that is inherent in Morse operation. This change has, moreover, done much to place the business on a basis where speed is subject to engineering development, and has made it possible to look with confidence to still further improvements, which will permit the maximum speed attainable by the highest type of operators to be utilized.

It is possible to determine the maximum speed attainable by operators at any given time, and while the standard thus set will undoubtedly improve as time goes on, the rate of increase will be slower and slower as perfection is approached. However, standards of equipment and operating practices which now exist or will be developed in the near future, will take care of the probable increase in operating efficiency for years to come. This state of affairs, which has existed only in recent years, has resulted from engineering research, which has met the economic need for apparatus and circuits that work at higher speeds than were even dreamed of a few years ago. Standards that were entirely satisfactory then are no longer sufficient to meet to-day's requirements, and they have passed into disuse, as new standards have been developed. The present goal in apparatus and line

speeds is the removal of all mechanical and electrical limitations to operators' productivity. Development of the ultimate in operating personnel is now going forward under increased effort as it becomes apparent that the maximum of efficiency is a definitely measurable quantity.

Another major factor in the advance of telegraphic communication has been the standardization of the printing telegraph as a means of speeding up the pick-up and delivery of messages to large users at terminal cities. Supplementing messenger handling, it has, in many cases, provided a means of exchanging messages between customer and telegraph company much more quickly than would be possible in any other way. This development necessitated standardization of equipment, both in customers' offices and in the telegraph company's operating rooms. In the latter, concentration units, specially designed for the work, have, by means of signal lights that flash the instant a call is received, facilitated the prompt answering of patrons who wish to send telegrams. Operators are able to connect their machines to any of a large number of circuits without moving from their positions. The number of idle operators is indicated by lights, thus permitting better assignment of forces and lowering costs.

Intraoffice belt conveyors and pneumatic-tube carrier systems operating at almost double their former speeds have adopted as the standard methods of moving messages from circuits on which they are received to those on which they are sent. High-speed tubes are also standard for use to near-by branch telegraph offices where conditions are such as to permit their installation.

Dissemination of market quotations over ticker circuits has been speeded up by the development and standardization of high-speed tickers that operate at 500 letters a minute as compared to a maximum of 300 letters a minute on older types of equipment. The new speed greatly reduces delays to market quotations during periods of intense trading activity at the New York Stock Exchange.

There are, of course, hundreds of minor ways in which standardization has served the telegraph business with excellent results. Standards of illumination that increase efficiency, standard-unit switchboards, universal repeaters, tables, signs, blanks, etc., are a few of the many examples that might be mentioned. Naturally, rapid advances in the telegraph business have, up to now, caused many standards to assume a status of semipermanence. They have, however, served their purpose, and as long as they continue to be replaced by higher ones, the country is assured of having the best possible telegraphic service.

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TRIBAL COMMUNICATIONS

Early Use of Signals Shows Primitive Adaptation of Principles of Standardization

Dr. WALTER HOUGH, *Smithsonian Institution*

Standardization in primitive arts shows only rudimentary beginnings with the inception of material culture. The expressions are mostly in terms of the nearest standards found in parts of the human body, as the arms and digits, which developed extensively before the scientific advance.

Means of communication depending on the eye and ear are referable to another field not connected with metrics. Language and gesture, growing up together as we believe, represent an early agreement or standardization of meaning. These would be used for communication over not very great distance—thus, language, near by; gesture, medium distance; and signals, far distance.

Sign language, which was a familiar feature of Indian communication, had developed at the coming of the white man into a general system intelligible over a large part of the United States west of the Mississippi. The signs represented form and motion, conveying to the mind a picture; that is, signs were ideographs, an extension of picture writing. Necessarily the speakers must have light in order to communicate, so that, aside from artificial light, sign language was a day language.

Much more effective was signaling which could be carried on at any time. The familiar visual signals with fire and smoke form a picturesque phase of primitive life. The night fire and day smoke served to convey simple messages to a far distance. By puffs of smoke separated by manipulation of fuel and a blanket or by number of fires the Indians signaled. At night by moving a blanket before a fire some information was conveyed. The code was simple and previously agreed upon among friends. Sometimes fire arrows were shot up at night and by their direction or curves to right or left conveyed a message. There are many references in ancient writings to these methods of signaling.

Wigwagging a blanket was a customary method of signaling by the Indians. Riding a pony in a circle or other figure was also a common device.

Even whistling signals were sent by some Indian tribes. Travelers record that they could be heard over incredible distances.

Sound signals were of proved usefulness among primitive peoples. The agents employed were drums and wooden gongs, the latter sometimes huge, excavated logs of hardwood producing a massive sound penetrating to a long distance.

In the Congo, Herbert Ward ordered the drum beaten to call a boat from the other shore of a wide African river. In answer he saw a boat put out. In order to test the system, he directed the beaters to announce that the boat was too small and to send a larger one. To his surprise he saw this done.

Erroneously, travelers thought that a code was employed in drum signals, but it is now found that a "drum language" was invented for the purpose. In the Cameroons, for instance, the language is well known, and sometimes the natives carry on a conversation by beating the language on the chest while the explorer is quite ignorant that something is being put over.

Another and most curious drum signaling is used by some tribes in South America. A diaphragm stretched on a wooden shell is sunk in the ground and a similar installation made in another village. Beating on one diaphragm causes particles of wood or leaves to dance on the diaphragm of the other, thus carrying the signals desired.

There is a widespread use of the drum in war, coming down from ancient times. First and last, bodies of soldiers have received orders by drum and whole populations roused to the threat of war.

In general, the information sent out by means of signals was conveyed through an agreed code which became the standard. Short cuts to language communication gave rise to jargons such as pidgin English, Chinook jargon, and many others representing agreed simplifications which suggest the process by which a universal language may arise.

FOOD AND DRUG COMPOSITIONS

That "legislative authority should be granted the Secretary of Agriculture to establish definitions of food products and to prescribe limits of composition for manufactured articles sold under the defined names," and that penalties for violations of the food and drug act be increased, are two recommendations for legislation which the Food and Drug Administration of the Department of Agriculture makes in its annual report.

The report also recommends that substandard drugs which are used in manufacturing be released from the requirements of the food and drug act, that the "slack-fill" package bill be passed by Congress, and that the part of the food and drug act which permits manufacturers to cloak low-grade products under trade names be stricken out.

The so-called "slack-fill" bill is intended to prohibit the use of deceptive packages and has been passed by the House of Representatives on several occasions. It is now pending before the Senate Committee on Agriculture and Forestry. The passage of this bill would materially increase the protection of the public.

The Food and Drug Administration recommends that the proviso to section 7, paragraph 1, in the case of drugs, be changed to include only drugs used for manufacturing purposes and be made applicable only to those substandard drugs which the pharmacopœia or formulary may specify as suitable for manufacturing purposes. There is no evident reason why preparations of medicine (not crude drugs) should be sold under pharmacopœial or formulary names, if they fail to meet the pharmacopœial or formulary tests.

AIRWAYS WEATHER SERVICE

Latest Possible Weather Reports Necessary to Pilots Flying at Speeds Exceeding 100 Miles an Hour

By CHARLES F. MARVIN¹

Since the inauguration of an airways weather service in 1926, the necessity for rapid transmission of airways weather reports, forecasts, and warnings, from center to center and from intermediate points on the airways to the centers, has become increasingly apparent. Airplanes flying at speeds in excess of 100 miles an hour are subject to extreme variations in weather conditions within such a relatively short period that the weather reports received by the pilot must necessarily be the latest possible before entering a given area in order that these variations may be properly taken into account.

In the early days of the service practically all communication was by telegraph and telephone, reports being made at such times as to just anticipate the departure of a plane along the airway. This system is also used at present on a number of airways over which traffic is light, consisting possibly of not more than four plane movements a day. However, in practically all cases such as this these reports are now supplemented by radiobroadcasts of terminal conditions received by the pilot in the air so that in reality even that type of service is greatly improved under modern conditions.

Realizing that a more rapid means of communication and one which was constantly available for use was necessary, the Department of Commerce, which is charged under the air commerce act to provide facilities for air navigation, other than meteorological service, in 1928 installed a telephone-typewriter system between New York and San Francisco on the transcontinental airway. The telephone-typewriter, commonly known as "teletype," is essentially what its name implies; that is, it is a typewriting machine upon which, whenever a key is struck at one station, the impulse is electrically transmitted to every other machine on the circuit and actuates the same key on those machines, thus reproducing at all other points the identical message placed on the machine at the sending point. It will readily be seen that such a system provides for the instantaneous transmission of regular or special reports along an airway and permits the sending of any number necessary without additional cost, and thus peculiarly meets the needs of the airways service. The first year's test proved the efficiency of the teletype system as an aid to air navigation, and it has now been extended to a large number of airways over which traffic is relatively heavy.

Hand in hand with the growth of the teletype system there has been established a large network of radio stations at principal terminals from which regular broadcasts of reports along designated airways are made. These stations are also equipped to handle radiotelegraph traffic. In addition to being located on airways equipped with teletype, they are also located at principal terminals along nontelegraphed airways and hourly reports exchanged and broadcast for these airways.

Now that we have a general picture of the equipment used, let us see exactly how it is used to provide needed weather information to the pilot of a transport plane operating, say, between New York and Chicago. We will say that the plane is scheduled to leave New York (Newark) at 9.30 a. m. About two hours before this time officials of the Weather Bureau at its various stations throughout the country, of which there are more than 200, have made observations of temperature, barometric pressure, cloudiness, precipitation, etc., and telegraphed the data to the forecast centers. Some of these reports are also received at the various stations themselves. At the forecast center at Washington, D. C., the signals were placed on the long-line teletype circuit between Boston and Washington and, since there is a machine at Newark, they are, of course, received there. The Weather Bureau personnel stationed there then enters the data upon a base map, drawing in the proper lines for equal barometric pressure and temperature, and from this a general picture of the weather over the entire country is obtained. State forecasts extending over a period of 36 hours and a route forecast for the airway to be flown and extending over a period of 12 hours were made up at Washington and transmitted by teletype to Newark. At about the same time that the regular reports to the forecast centers were telegraphed certain selected stations from 100 to 200 miles on either side of the airway also transmitted to Cleveland, by means of telegraph, teletype, or radio, airways weather reports giving general conditions, ceiling, visibility, wind, temperature, dew point, and barometric pressure. These were plotted on a special map at Cleveland and from this a special summary covering the area from New York to Chicago and a forecast of expected conditions in this area for the next four hours were prepared and transmitted by teletype to all necessary points, including Newark.

When the pilot arrives at the airport, he finds that all this information is available for his benefit at the Weather Bureau office. If the weather appears at all unfavorable, he may also discuss the general situation with the Weather Bureau official on duty.

In addition to the foregoing, the teletype has provided still further information, in that at a stated minute each hour all stations between Cleveland and New York (about 12) report the weather at that time in sequence; that is, one station immediately follows the one preceding in placing its report of weather conditions on the teletype, the sequence starting at one end of the circuit. These reports, when available in connection with the forecasts, map, and summary previously mentioned, complete the picture of the weather, as it is locally influenced by general conditions, and provides the pilot with an accurate outline of conditions to be expected.

However, the service to him does not end here, but extends to the flight itself, inasmuch as through his

¹ Chief, Weather Bureau, U. S. Department of Agriculture.

radio receiver he receives the broadcasts of later sequences, or in case of a decided change in conditions, special reports, made by the radio station. He is thus provided with a means of checking the progress of conditions as he has seen them shown on the maps and in the forecasts and has a definite knowledge of conditions both ahead and behind at all times.

It should be understood, of course, that the plan of service described extends, with slight variations due to topography, geographical location, etc., to practically all the heavily traveled airways of the country and that all pilots flying the route may receive this service.

The importance of rapid communication to this system can not be overestimated. In fact it can readily be realized that without it no such service would be possible, and it is not too much to say that without this development the tremendous volume of air traffic now carried on would be very seriously hampered and very probably would not be practicable with any large degree of safety.

HOSIERY LENGTHS AND MEASUREMENTS

Commercial Standard Now Before Industry for Signed Acceptance

Mimeographed copies of the commercial standard for hosiery lengths, as approved by a general conference of the industry held October 29, 1931, have been sent to all interests for signed acceptances.

These specifications are the result of long research by the industry to select a method of measuring the length of hosiery and to formulate standard lengths and tolerances which, if followed in the manufacture of this commodity, will produce hosiery that will prove satisfactory to the greatest number of users. The immediate object of the adoption of standard lengths for hosiery is to provide a better understanding between buyer and seller as to what constitutes the normal length and tolerances for a given type and size of hose; to set up a basis upon which satisfactory full-size hosiery may be certified to the user; and from which the dealers or buyers may determine whether or not they are receiving skimp-cut merchandise.

In measuring hosiery, each stocking is laid out, without tension, on a smoot, flat surface so that creases and wrinkles will not affect the measurements; the length is then taken to the nearest one-eighth inch, from the bottom of the heel, through the heel gore to the top in a line parallel to the front edge.

The specifications and measurements embraced in the approved standard cover the method of measuring, measurements, and tolerances for the lengths of ladies', men's, boys', children's, misses', and infants' hosiery, and infants' and children's socks, together with standard folded cuff lengths for boys' golf hose and children's 7/8 hosiery.

Thirty inches with a plus or minus tolerance of 1 inch was set as a standard length for ladies' hosiery, but this measurement is in no sense intended as a specification limiting the length of hosiery. Lengths both longer and shorter than 30 inches are generally carried in stock by the average retailer and may be had when requested. A statement to this effect is incorporated in the standard.

Possibly the item next in importance is the measurements of men's socks, lengths of which range from 14 inches for a size 9 to a 14½-inch length for size 10½ and over, with a plus or minus tolerance of one-half inch. Complete specifications covering the lengths and tolerances of the other types of hosiery are included in the standard.

It is understood that formal adoption of these standard lengths and tolerances will not entail any material changes in present commercial practices on the part of the more reputable producers who have been following these lengths for a number of years.

A. S. T. M. 1931 TENTATIVE STANDARDS

The American Society for Testing Materials has announced the availability of its 1931 book on tentative standards. Consisting of 1,008 pages, it contains 180 tentative standards, methods of test, definitions of terms, and recommended practices in effect at the time of publication of the book.

The term "tentative" applies to a proposed standard published for one or more years, with a view of eliciting criticism, before it is formerly adopted as standard by the A. S. T. M. In the 1931 book, 44 of the standards relate to metals and 136 to nonmetallic materials and products. Although these tentative standards are in the trial stage of the A. S. T. M. procedure, they represent the latest thoughts of the committees on these specific subjects, and therefore are being applied in many industries. In addition, a complete list of all the standards and tentative standards of the society in effect September 1, 1931, is included.

INDIA FINDS NEED FOR STANDARD JUTE GRADES

Proposals for the establishment of a corporation in India to fill a long-felt need for standard grades and also to stabilize jute prices are contained in the majority report issued by the Indian Central Banking Inquiry Committee, according to information received from Assistant Trade Commissioner Wilson C. Flake at Bombay.

The committee recommends that the governments concerned (presumably the governments of Bengal, Bihar, Orissa, and Assam) examine the matters of grading and prices and introduce an arrangement suitable for all interests affected.

Prompt steps by the local governments in jute-growing provinces for the fixation of proper standards of jute are suggested by the committee. A further recommendation is that a properly organized futures market be established by legislation, the committee having been informed that the East Indian Jute Association has failed to achieve its purpose of imparting a steady tone to jute prices.

The Indian Central Banking Inquiry Committee was appointed by the Government of India in July, 1929, to make a thorough study of jute trade, on which the above-mentioned report has just been released.

FEDERAL SPECIFICATIONS

Twenty-three specifications were acted on by the Federal Specifications Board during the month of November. Of this number 5 were submitted for consideration as proposed specifications, and 18 were submitted for revision. The specifications submitted for revision bear the new designation in accordance with the system used in the Federal Standard Stock Catalogue. Copies of these specifications (in mimeographed form) and further information can be obtained from the Federal Specifications Board, Bureau of Standards, Washington, D. C.

Specifications proposed		
Asphalt emulsion, quick-breaking type (for use in road work). Slate, roofing. Glass, glazing, for transmitting ultra-violet radiations of certain wave lengths. Tents (dyed) and tent appliances (designation K-T-211). Cambrie.		
New designation	Specifications for revision	Former F. S. No.
QQ-B-621.....	Brass, commercial and naval, castings.....	272
QQ-B-691.....	Bronze, castings.....	172a
QQ-F-151.....	Ferrochrome.....	139
QQ-M-71.....	Manganese ore.....	142
QQ-R-571.....	Rods, welding, nonferrous, (for) gas welding.....	269a
UU-P-31.....	Paper, general specifications.....	394
UU-P-416.....	Paper, photographic, black line.....	
UU-P-418.....	Paper, photographic, negative.....	
WW-U-536.....	Unions, 300-pound, malleable iron or steel.....	580
DD-D-C-491.....	Cloths, wiping.....	260
GGG-C-311.....	Chisels, gouges and slicks, woodworking.....	438
GGG-C-751.....	Cutters, glass (wheel type).....	435
GGG-D-351.....	Dividers.....	436
GGG-K-471.....	Knives, drawing.....	488
GGG-L-51.....	Ladles, plumbers'.....	474
GGG-P-791.....	Pullers, nail.....	418
GGG-S-271.....	Shaves, spoke.....	450
GGG-T-671.....	Trowels, plastering, cement, brick, and pointing.....	584

SIMPLIFIED CALENDAR

Definite action to simplify the calendar is generally anticipated before 1939, according to Dr. C. F. Marvin, Chief of the United States Weather Bureau. The year 1939 will begin on a Sunday, and such an action as is hoped may be taken would result in all succeeding years beginning on the first day of the week, he said.

Doctor Marvin returned recently to Washington after attending, as a technical representative of this country, the meeting of the League of Nations committee on communications and transit, which considered the reform of the calendar. The committee, made up of delegates from 44 nations, concluded that disturbed conditions rendered the present time inopportune for the general simplification of the calendar, he explained.

The stabilization of the date of Easter, however, he said, was recommended by the committee, which proposed that this date should be the Sunday after the second Saturday in April. Representatives of all churches were asked to put this plan into effect, in a note formulated by the committee. The text of this note can not be made public, however, until it has been referred to the Department of State for study and possible suggestions for changes in its terms. As soon

as the churches approve fixation of the date, the change can be put into effect at once. It is expected that the churches' attitude will be expressed by 1933.

It was deemed preferable not to consider any reform which would not remedy the most serious defects of the present calendar. For example, a mere equalization of the quarters would not be accompanied by changes sufficient to counterbalance the difficulties which must necessarily be encountered in connection with any modification of traditions.

ABRASIVE GRAIN SIZES SIMPLIFIED

Reaffirmation has been given by the industry to the simplification program covering abrasive grain sizes. The approval for the recommendation, as given by the standing committee, will serve to place the recommendation in effect for another year without any changes in its schedule.

This simplification (Simplified Practice Recommendation R118-30) establishes a table of allowable limits for the sizing of aluminum oxide and silicon carbide abrasives for polishing uses, and for grinding-wheel manufacture.

At their recent meeting, the producers of abrasive grains adopted a resolution stating the desirability of identifying the grain made in accordance with the simplified practice recommendation. The following phrase was selected by them as the proper and only one to be used: "This abrasive has been made to comply with Simplified Practice Recommendation R118-30, issued by the U. S. Department of Commerce."

RUSSIAN CINEMA COMPANY PROPOSES 30 STANDARDS

A proposal for standardizing motion-picture equipment has been presented by Soyuzkino (All-Union Cinema Co.) to the All-Union Committee on Standardization, according to the Soviet Union's Bulletin of Standardization.

The project calls for working out 30 standards—8 for raw materials and 22 for equipment. Of these, 26 standards were scheduled for development during 1931 and 4 for 1932.

The raw materials include photogelatine, negative and positive materials for light filterers, an assortment of chemicals for the making of photoproducts, auxiliary lighting materials and accessories. The equipment includes laboratory and auxiliary equipment, cinema projecting apparatus with appurtenances, projecting booths, lighting apparatus, photo-equipment, auxiliary and demonstrating equipment.

The All-Union Committee on Standardization has so far approved two of the proposed standards, relating to laboratory preparation for mounting cinema film and laboratory preparation for mounting photo paper.

INTERNATIONAL COOPERATION IN AERONAUTICS IMPROVES

Marked progress in international cooperation in the operation of air services is indicated by the fact that 25 commercial air transportation companies, representing 15 countries, are now members of the International Air Traffic Association. The association was created in August, 1919, to meet the needs of air traffic companies operating on an international basis and constituted a free union of companies representing Germany, Denmark, Great Britain, Norway, and Sweden.

To bring about standardization in the operation of air services in which two or more countries are concerned, even if difficult, and in so doing to conform to the regulations of the International Convention for Air Navigation and agreements between countries as well as national laws and regulations, are the objects of the association.

Close cooperation is maintained with the International Commission for Air Navigation, which treats all questions relative to public air law, such as certificates of airworthiness, pilots' licenses, air cartography, wireless, physical requirements of pilots, etc., and with the International Technical Committee of Judicial Experts, and other kindred organizations.

WATCH MANUFACTURERS PLAN TO ENFORCE TRADE RULES

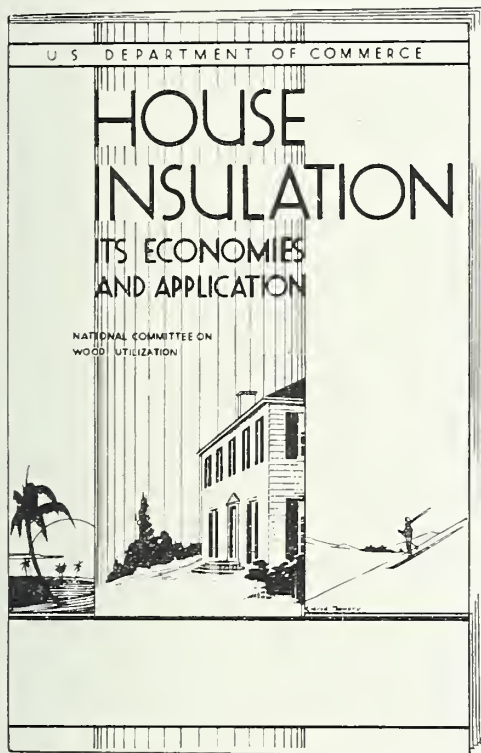
Watch manufacturers plan to enforce trade practice rules of the trade. A recent meeting of the manufacturers voted to effect such a program, which would provide for shoppers collecting watchcases for testing by purchase in the open market.

The rules of the industry, as recently approved by the Federal Trade Commission, relate to the proper placing of a trade-mark on a watchcase; restrictions of the line of time guarantee cases; official standard for cases entitled to bear a 25-year guarantee stamp, a 20-year guarantee stamp, a 10-year guarantee stamp, use of the word "gold" or a karat mark, or both, or colorable imitations of such words or marks in cases containing less than one and one-half thousandths of an inch of gold on the outer surface; the principle "that the time guarantee or any word or description intended, directly or by inference, to describe the quality of a watchcase, has exclusive bearing and relationship to the wearing quality of the precious-metal content of the case and to no other feature"; and recommendation that all nickel or base-metal cases be stamped with the words "nickel" or "base metal," as well as condemnation of the manufacture and sale of cases unless so stamped.

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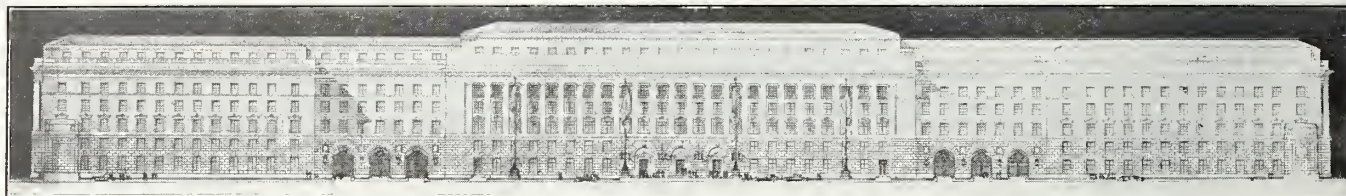
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THE UNITED STATES DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary of Commerce

"* * * this department * * * is devoted solely to aiding and fostering the development of higher standards of living and comfort of our people * * * its ideals are clear: That by cooperation and not by compulsion it should seek to assist in maintaining and giving the impulse of progress to commerce and industry in a nation whose successful economic life underlies advancement in every other field."

—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.



AERONAUTICS BRANCH, CLARENCE M. YOUNG, Assistant Secretary of Commerce for Aeronautics.

Establishment of civil airways and maintenance of aids to air navigation; inspection and registration of aircraft and licensing of pilots; enforcement of air traffic rules; investigation of accidents; encouragement of municipal air ports; fostering of air commerce; scientific research in aeronautics; and dissemination of information relating to commercial aeronautics. (Some of these functions are performed by special divisions of the Lighthouse Service, the Bureau of Standards, and the Coast and Geodetic Survey.)

BUREAU OF THE CENSUS, WILLIAM M. STEUART, Director.

Taking censuses of population, mines, and quarries, water transportation, and religious bodies every 10 years; censuses of agriculture and electrical public utilities every 5 years; and a census of manufactures every 2 years. Compilation of statistics of wealth, public debt and taxation, including financial statistics of local governments, every 10 years; annual compilation of financial statistics of State and municipal governments.

Compilation of statistics of marriage, divorce, births, deaths, and penal and other institutions annually, and of death rates in cities and automobile accidents weekly.

Compilation quarterly or monthly of statistics on cotton, wool, leather, and other industries; annually of forest products.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE, F. M. FEIKER, Director.

The collection of timely information concerning world market conditions and openings for American products in foreign countries, through commercial attachés, trade commissioners, and consular officers, and its distribution through weekly Commerce Reports, bulletins, confidential circulars, the news and trade press, the monthly Survey of Current Business, and district and cooperative offices in 65 cities. The maintenance of commodity, technical, and regional divisions to afford special service to American exporters and manufacturers.

The compilation and distribution of lists of possible buyers and agents for American products in all parts of the world and publication of weekly lists of specific sales opportunities abroad.

The publicity of statistics on imports and exports.

The study of the processes of domestic trade and commerce.

BUREAU OF STANDARDS, GEORGE K. BURGESS, Director.

Custody, development, and construction of standards of measurement, quality, performance, or practice; comparison of standards used by scientific or other institutions; determination of physical constants and properties of materials; researches and tests on materials and processes; and publication of scientific and technical bulletins reporting results of researches and fundamental technical data.

Collection and dissemination of information concerning building codes and the planning and construction of houses.

Establishment of simplified commercial practices through cooperation with business organizations in order to reduce the wastes resulting from excessive variety in commodities.

BUREAU OF MINES, SCOTT TURNER, Director.

Technical investigations in the mining, preparation, and utilization of minerals, including the study of mine hazards, and safety methods and of improved methods in the production and use of minerals.

Testing of Government fuels and management of the Government Fuel Yard at Washington.

Research on helium and operation of plants producing it.

BUREAU OF MINES—Continued.

Studies in the economics and marketing of minerals and collection of statistics on mineral resources and mine accidents.

The dissemination of results of technical and economic researches in bulletins, technical papers, mineral resources series, miners' circulars, and miscellaneous publications.

BUREAU OF FISHERIES, HENRY O'MALLEY, Commissioner.

The propagation and distribution of food fish and shellfish, in order to prevent the depletion of the fisheries; investigations to promote conservation of fishery resources; the development of commercial fisheries and agriculture; study of fishery methods, improvements in merchandising, and collection of fishery statistics; administration of Alaska fisheries and fur seals; and the protection of sponges off the coast of Florida.

BUREAU OF LIGHTHOUSES, GEORGE R. PUTNAM, Commissioner.

Maintenance of lighthouses and other aids to water navigation. Establishment and maintenance of aids to navigation along civil airways. Publication of Light Lists, Buoy Lists, and Notices to Mariners.

COAST AND GEODETIC SURVEY, R. S. PATTON, Director.

Survey of the coasts of the United States and publication of charts for the navigation of the adjacent waters, including Alaska, the Philippine Islands, Hawaii, Porto Rico, the Virgin Islands, and the Canal Zone; interior control surveys; magnetic surveys; tide and current observations; and seismological investigations. Publication of results through charts, coast pilots, tide tables, current tables, and special publications.

BUREAU OF NAVIGATION, ARTHUR J. TYRER, Commissioner.

Superintendence of commercial marine and merchant seamen. Supervision of registering, enrolling, licensing, numbering, etc., of vessels under the United States flag, and the annual publication of a list of such vessels.

Enforcement of the navigation and steamboat inspection laws, including imposition of fees, fines, tonnage taxes, etc.

STEAMBOAT INSPECTION SERVICE, DICKERSON N. HOOVER, Supervising Inspector General.

The inspection of merchant vessels, including boilers, hulls, and life-saving equipment, licensing of officers of vessels, certification of able seamen and lifeboat men, and the investigation of violations of steamboat inspection laws.

UNITED STATES PATENT OFFICE, THOMAS E. ROBERTSON, Commissioner.

The granting of patents and the registration of trade-marks, prints, and labels after technical examination and judicial proceedings.

Maintenance of library with public search room, containing copies of foreign and United States patents, and trade-marks. Recording bills of sale, assignments, etc., relating to patents and trade-marks. Furnishing copies of records pertaining to patents. Publication of the weekly Official Gazette, showing the patents and trade-marks issued.

RADIO DIVISION, W. D. TERRELL, Chief.

Inspection of radio stations on ships; inspection of radio stations on shore, including broadcasting stations; licensing radio operators; assigning station call letters; enforcing the terms of the International Radiotelegraphic Convention; and examining and settling international radio accounts.